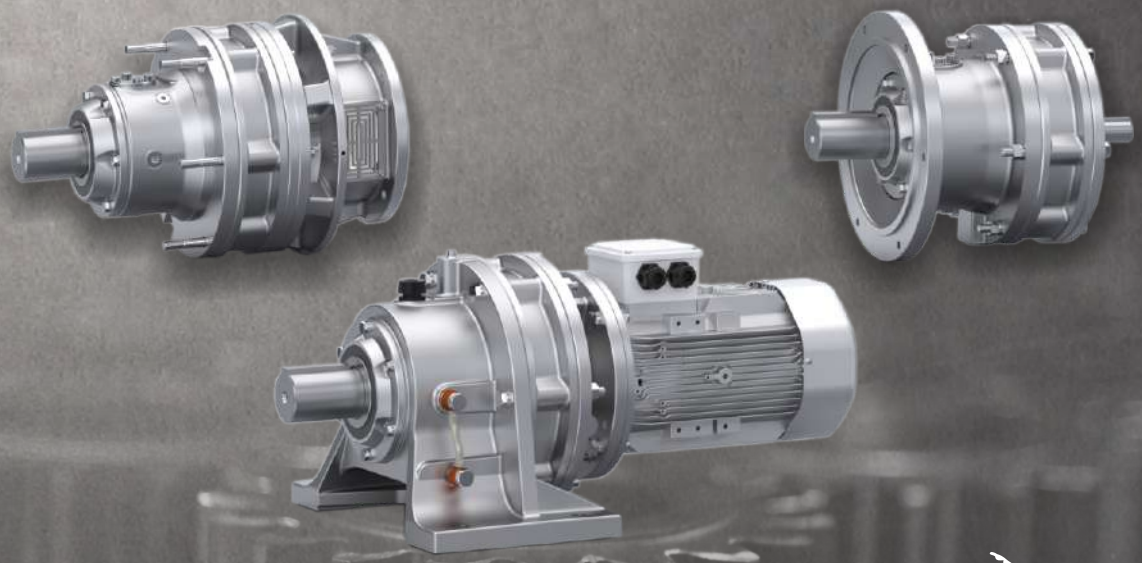
MAINTENANCE AND OPERATION INSTRUCTIONS | EN

PCD SERIES

Cycloidal Gear Units

GEAR UNIT WITH MOTORS / WITHOUT MOTORS



ATEX

PGR®
DRIVE TECHNOLOGIES

Doc. No: PG.KK.AG.015_00
Rev. / Publication Date: 11.2024

TSE K 558

CE

Certificate No: KY3723/05/10-R15

K - Q TSE-ISO-EN 9000

K - Q TSE-ISO-EN 9001

PGR®
DRIVE TECHNOLOGIES

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1.1 Important Warnings

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

Table 1: Safety Alerts and Information Signs

EXPLOSION !

Indicates an immediate danger, which may result in death or serious injury.
Contains important information regarding explosion protection.

ATTENTION !

Dangerous situation and possible outcome
Mild or major/minor injuries
This indicates that minor personal injury may occur if proper precautions are not taken.

NOTE !

Advice and useful information for the user
This indicates that property damage may occur if proper precautions are not taken.

DANGER !

Harmful situation and possible outcome
Damage occurs in the reducers and the environment.
If proper precautions are not taken, serious damage on the gearbox may occur, death or serious personal injury will result.

DANGER OF ELECTRICITY !

Electrical shock hazard and possible outcome
Death and serious injuries

DANGER !

Danger and possible outcome
Death and serious injuries

WARNING !

General usage information
If proper precautions are not taken that indicates serious personal injury may occur.

Table 2: General Warnings

ISO	ANSI	WARNINGS
		Warning - Dangerous Electrical Voltage
		Warning - Explosives
	---	Warning - Jamming Hazard
	---	Warning - Hot Surfaces
	---	Warning - Irritant or Harmful Substances
	---	Warning - Corrosive Substance Hazard
	---	Warning - Suspended Load
	---	Warning - Hand Injuries
		ATEX Certificate

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, installion / mounting, connection, operating, maintenance and repair processes. All the purchase and technical datas are positioned at product catalogues. Beside engineering applications, the informations which placed in this instruction, should be well read and applicated. 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 prepared by motor - producing firm.

EXPLOSION !

All the informations those boxes include would only state proper goods to the instruction of ATEX 2014/34/EU.
Processes which related to these regulations should only be made by personnel (qualified) who has expertise regarding security in the fields that has the probability of being exploded.

1.3 Correct Use

EXPLOSION !

Only components which comply with the applicable regulations of Directive 2014/34/EU may be fitted and operated.
Observe the Declaration of Conformity and all safety information for the components.

These gear units generate a rotational movement and are intended for use in commercial systems. They satisfy the explosion protection requirements of Directive 2014/34/EU for the product category indicated on the type plate. No mixture from categories IID and IIG may be present during operation. The ATEX approval is void in case of a hybrid mixture.

Commissioning (start of proper operation) is prohibited until it has been established that the machine complies with the local laws and directives. The EMC Directive 2014/30/EU and the Machinery Directive 2006/42/EC in their currently valid scope of application must be complied with in particular.

DANGER !

Danger to persons:

Appropriate safety measures must be taken in the case of applications in which failure of a gear unit or geared motor may cause a hazard to persons.
Safeguard a wide area around the hazard zone.

1.4 Safety Information

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.
All work, e.g. transportation, storage, installation, electrical connection, commissioning, servicing and maintenance must be performed in a non-explosive atmosphere.

EXPLOSION !

In environments with potentially explosive atmospheres, only ATEX units are allowed, after verifying their certification limits. In case of non-ATEX units, or ATEX units with certification non-compliant with environmental conditions, it is compulsory to disconnect the unit power supply. Adopt all the necessary measures of environmental safety.

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, mountage, 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 Use and Maintenance Instructions / catalog data of the relevant product,
- 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 accidential protection,
- Disassembly of gearbox should only be made by authorized personnels.

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 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 misusage of gear unit / gear unit with motor in plant,
- Extremely dirty and maintenance free of gear unit / gear unit with motor,
- Without oil and without grease usage,
- Usage of product other than out of 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 3. persons,
- Additional dangers that could be generated during power cut can be prevented by materials such as brake/key.

1.5 Responsibility

PGR accepts no liability if the following occurs:

- Use of reducers that do not comply with national laws on safety and accident prevention,
- Work done by unqualified personnel,
- Wrong installation,
- Tampering with the product (making changes),
- It does not accept any liability for non-observance or inaccuracy of the instructions in the manual, for damage or malfunctions resulting from non-observance of these operating instructions.
- To follow the signs indicated on the product labels of the reducers incorrectly or inappropriately,
- Wrong electrical energy for geared motor reducers,
- Incorrect connections and/or use of temperature sensors (if any),
- Oil-free use of the reducer,
- The content of this guide has been reviewed to ensure consistency with the documents such as catalog etc. We cannot guarantee full consistency, as dynamic required by the system cannot be completely blocked. However, the information in this manual is regularly reviewed and corrections are made in subsequent editions.

Since products supplied by PGR are designed to be included in "complete machines", commissioning them is prohibited until the full machine has been declared compatible.

Restarting the reducer:

When installing the reducer on machines or systems, the machine or system manufacturers must ensure that the regulations, notes and descriptions contained in this operating manual are included in their operating manual.

DANGER !

Only the configurations found in the product catalog are allowed. Do not use the product contrary to the indications given in the product. The instructions given in this manual do not replace the obligations of current laws regarding safety regulations and do not compensate for any damages.

1.6 Transportation

1.6.1 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 must be 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.

1.6.2 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.

1.6.3 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 both 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 cataloque.

NOTE !

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

ATTENTION !

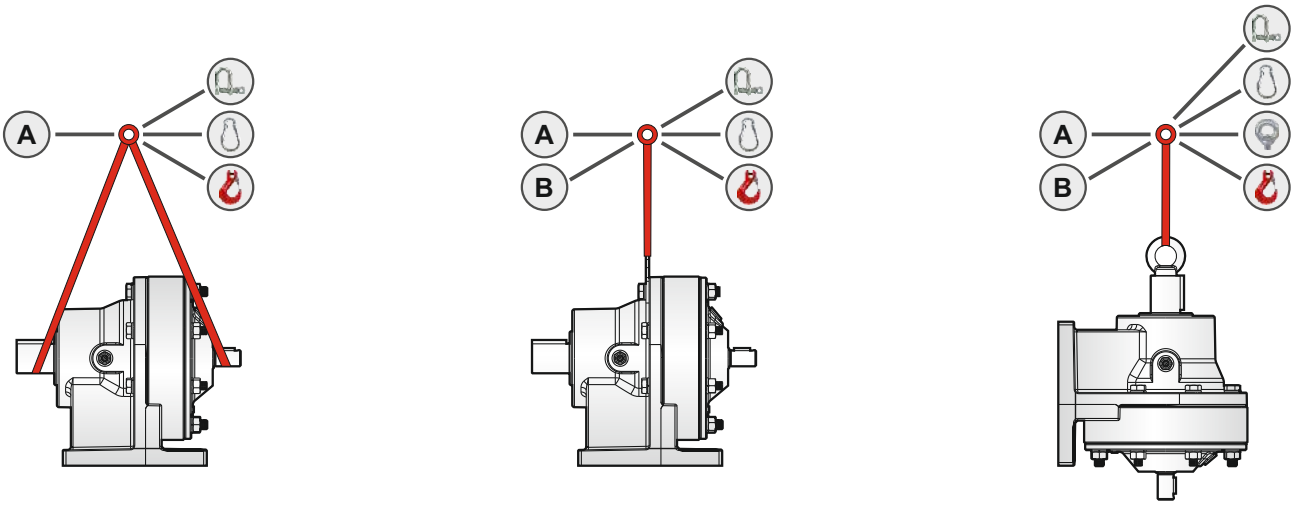
If the connection tool is coupling between electric motor and gear unit, lifting eyebolt should not be used.

1.6.4 Transport of Gearboxes;

Figure 1: Transport of Gearboxes

PCD 607 - 615

HW



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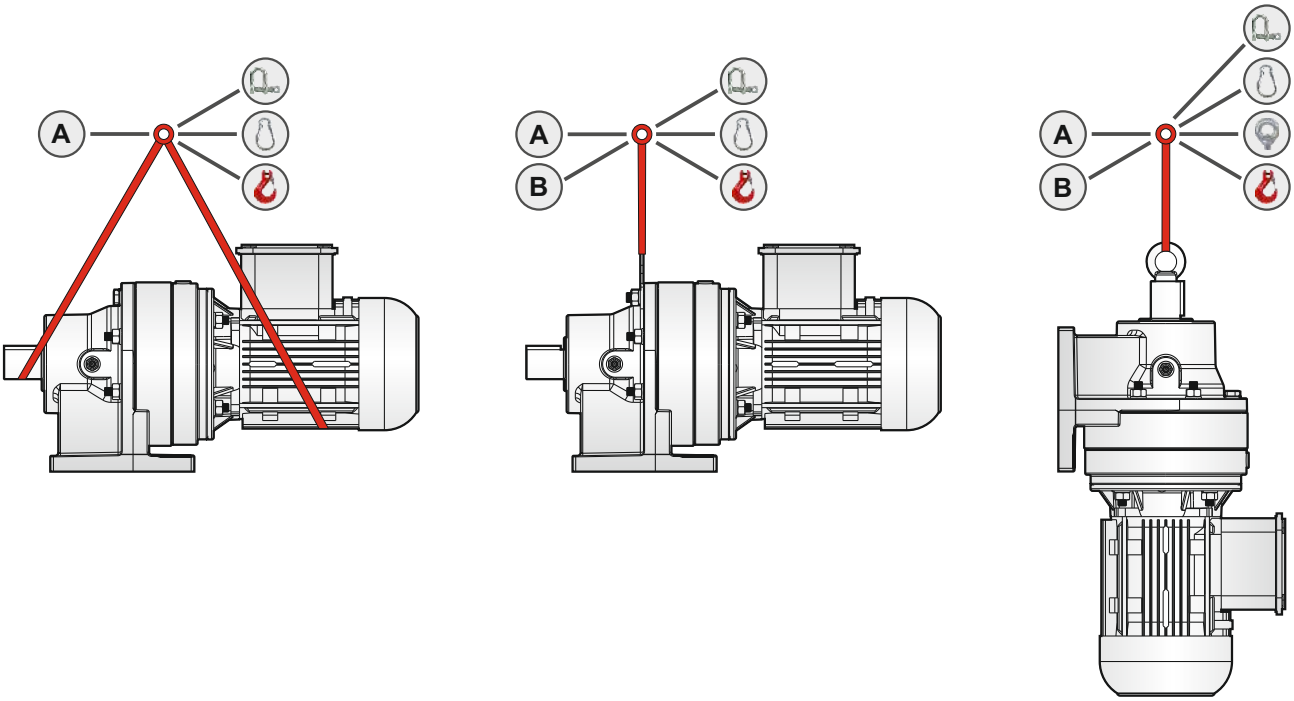


A Hoop equipped (swab)

B Hoop equipped (chain)

Load hook

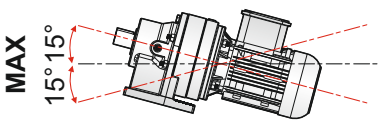
Screw hook

Locked hook

Lifting eyebolts

Manuel lifting (Weight ≤ 15 kg)
(ref. ILO Contract)
Not valid for the continuous carrying.

The allowable maximum slope is 15 degree.



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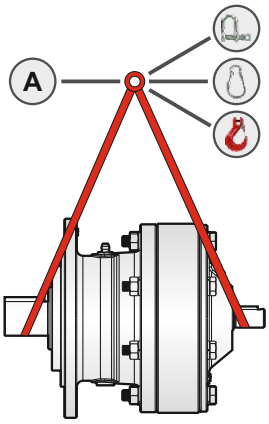

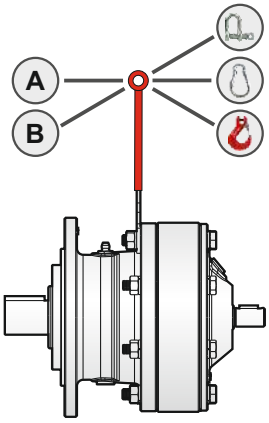

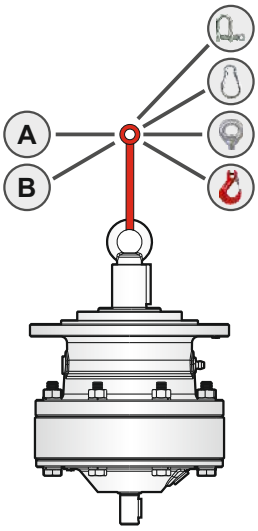

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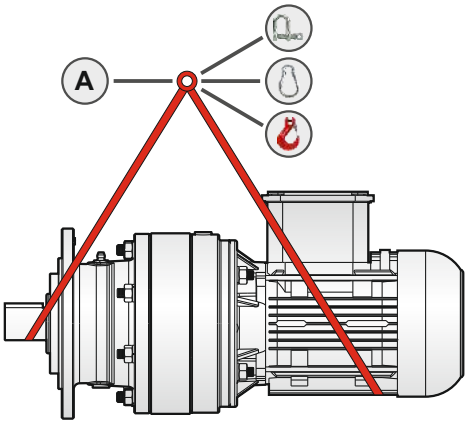
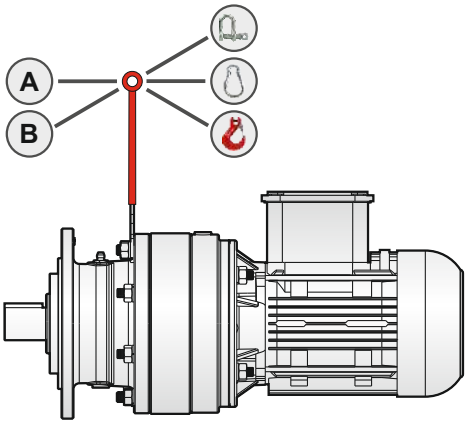
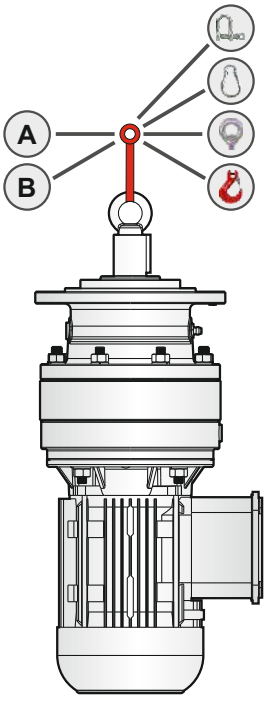






A Hoop equipped (swab)

B Hoop equipped (chain)

Load hook

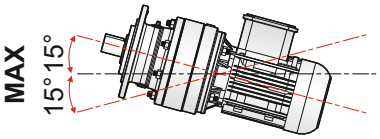
Screw hook

Locked hook

Lifting eyebolts

Manuel lifting (Weight ≤ 15 kg)
(ref. ILO Contract)
Not valid for the continuous carrying.

The allowable maximum slope is 15 degree.



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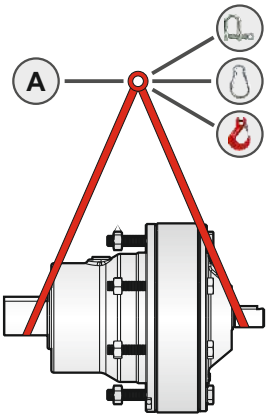

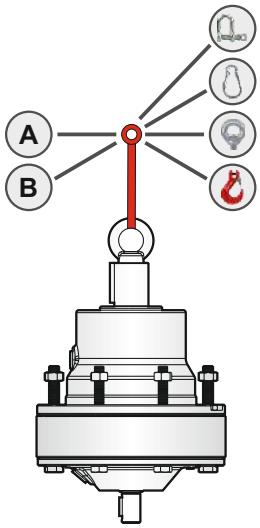

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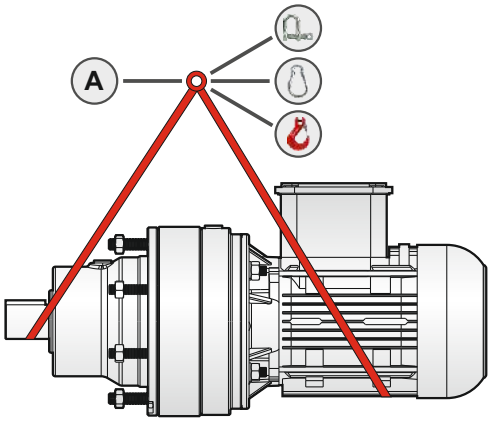

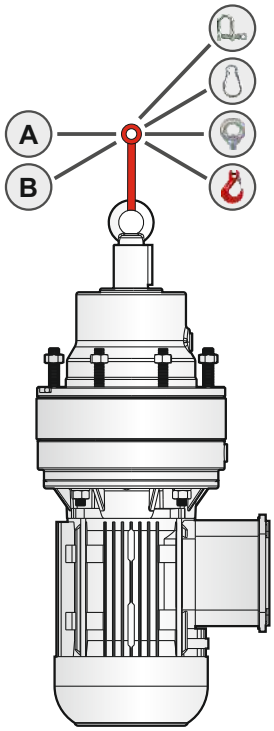

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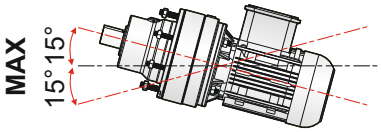

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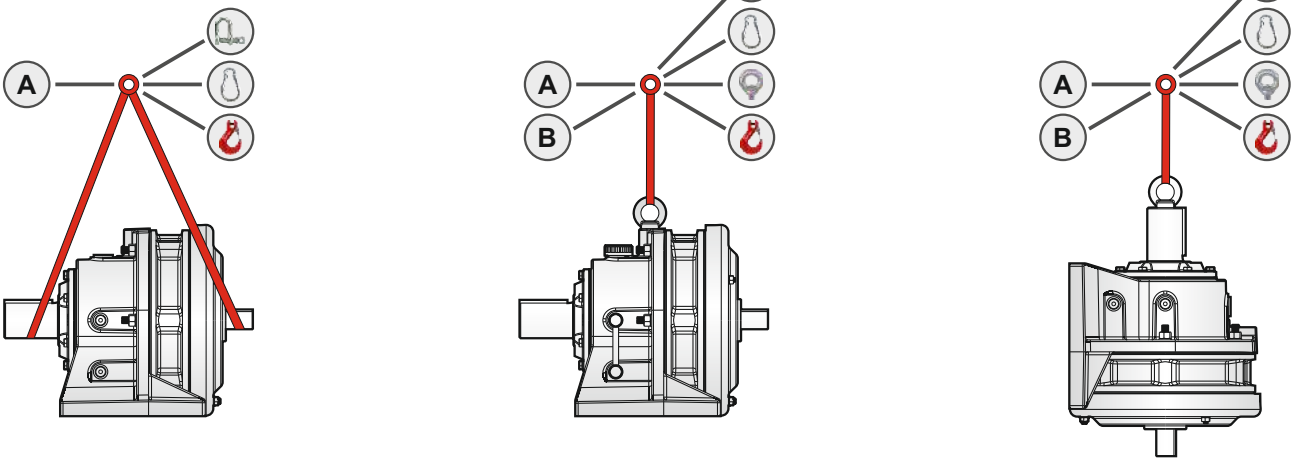

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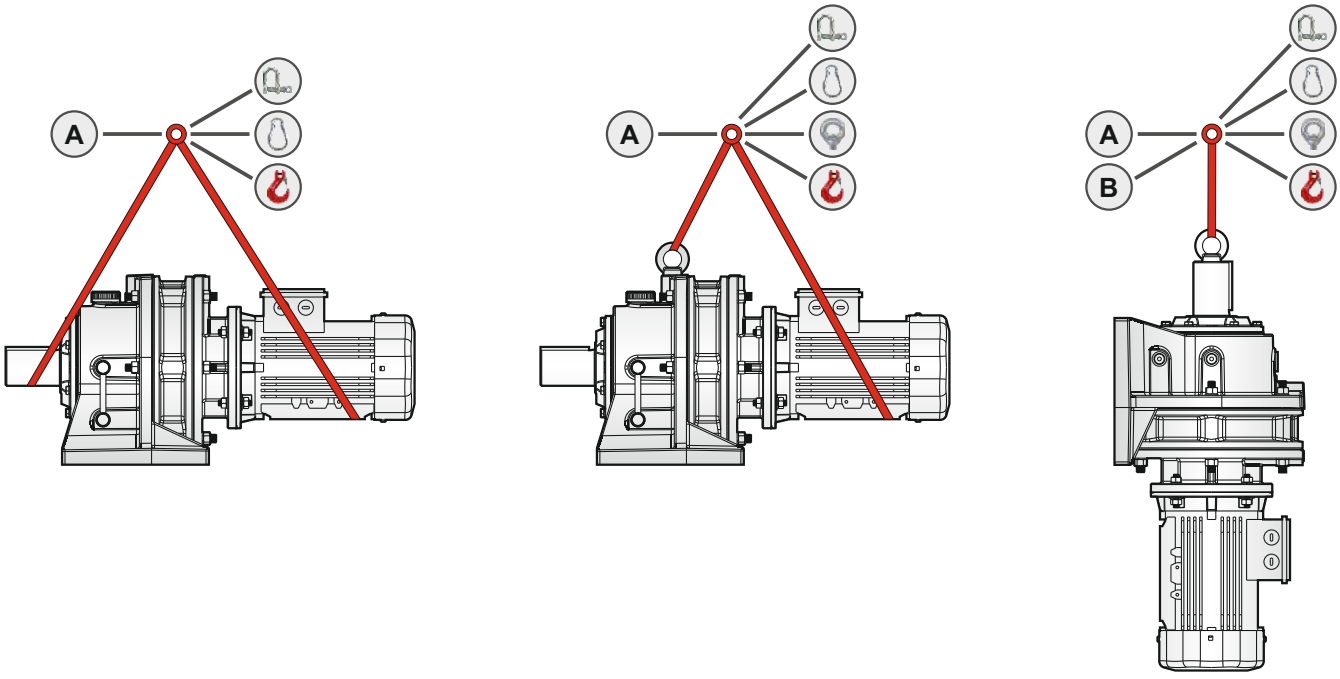

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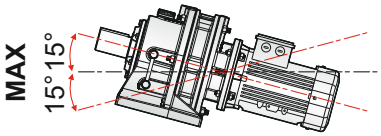

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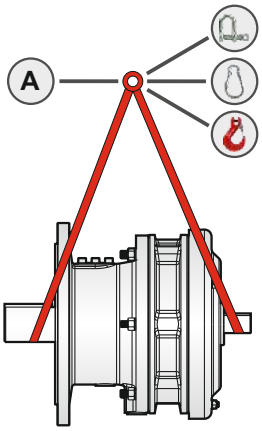

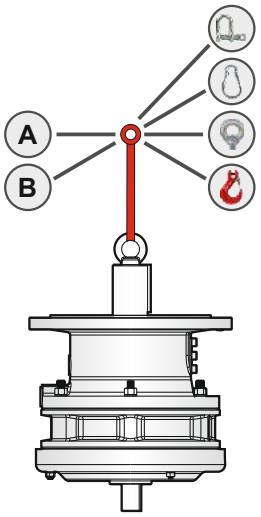

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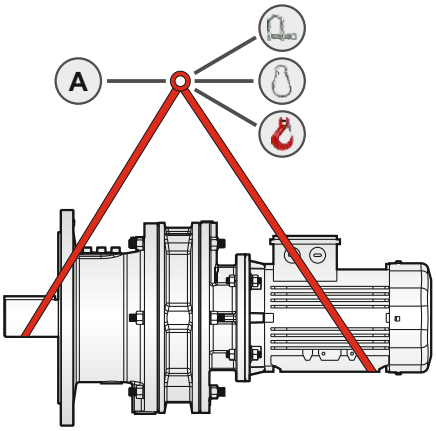

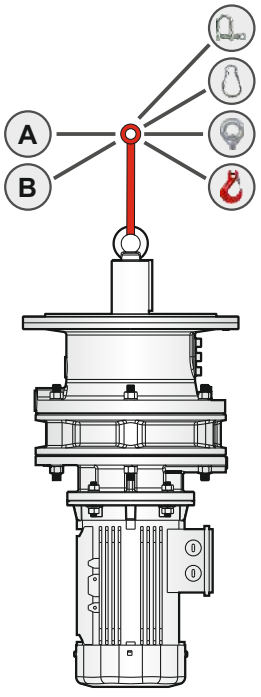

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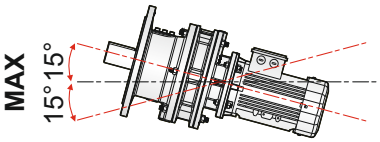

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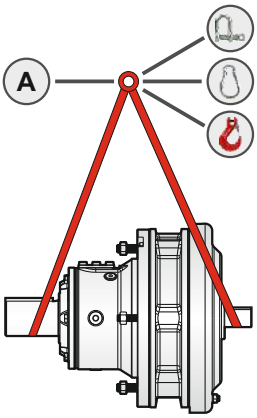

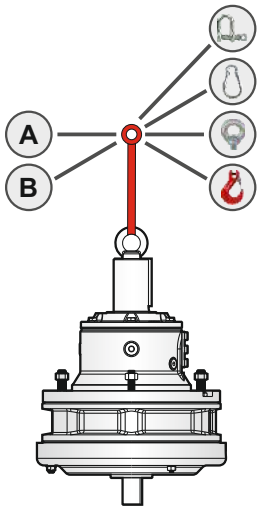

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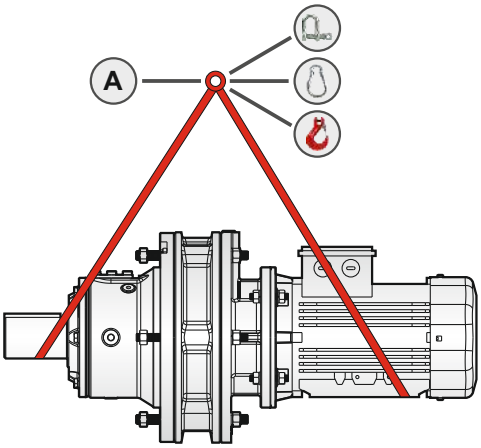

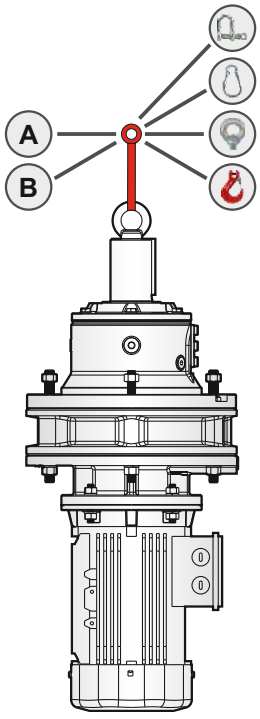

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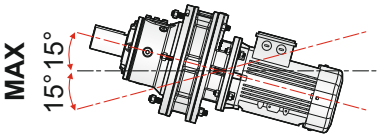


1.7 Storage

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 hollow 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 -10°C and +50°C.
- Relative humidity must be less than %60.
- Not directly be exposed to sunlight and infraded 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.

EXPLOSION !

Gearboxes during storage;
Provide protection of unpainted and processed areas by lubricant. In case of areas getting rusted, ATEX certificate will be no longer valid.

EXPLOSION !

These processes should be made far away from explosive atmosphere.
If there is an unproper oil inside of gearbox to operate, this oil must be discharged and be cleaned.

SECURITY MEASURES !

Precautions to be taken when returning the gear unit to service after storage:

The output shafts and external surfaces must be thoroughly cleaned of all rustproofing product, contaminants and other impurities (use a standard commercial solvent).

Do this outside the explosion hazard area. The solvent must not touch the seal rings as this may damage them, causing them to leak.

If the oil or protective material used during storage is not compatible with the synthetic oil used during the machine's operation, the interior of the unit must be thoroughly cleaned before filling with the operating oil.

The service life of the bearing grease is reduced if the unit is stored for more than 1 year. The bearing grease must be synthetic.

1.7.1 Long Term Storage Suggestions;

NOTE !

- In the long-term storage or during the short-term storage, if the excessive temperature differences occur, the oil in the gear unit must be changed before the operating.
- In the fully oil filled gear unit, the oil level should be reduced according to the mounting position.

ATTENTION !

- The incorrect and excessive long storage could cause the gearbox getting defected.
- Please control not to exceed allowed storage period before starting up the gearbox.

NOTE !

- PGR, recommends long-term storage option for periods of more than 9 months holding and pausing times.
- By paying attention both to the long-term storage option and precautions which listed below, the holding of goods up to 2 years could be possible. Because of real efficiency of gearboxes depending on local conditions widely, these periods could be seen solely guide values.

Long term storage suggestions;

- Mineral oil, synthetic oil, or grease should be filled according to the assembly position, ready for operation. However, the oil level or grease level should be checked before starting.
- 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.

2.1 Gear Unit Label

EXPLOSION !

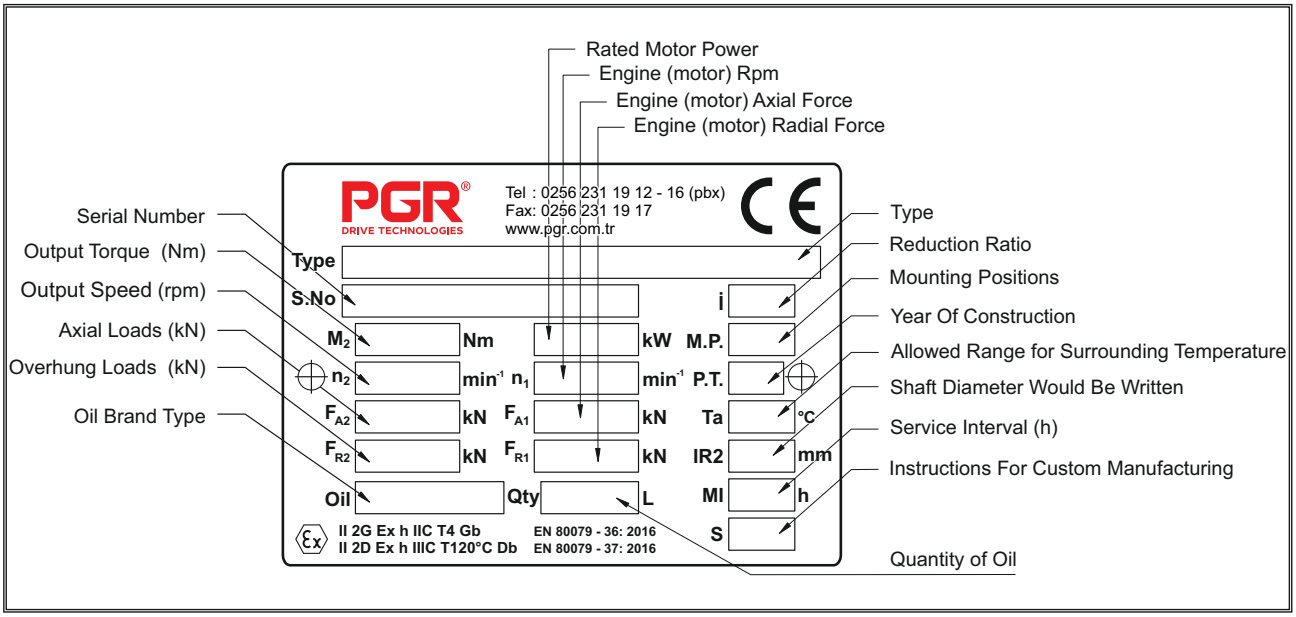
Explosion hazard: Failure to comply may cause severe, or even fatal injuries.
It must be checked and ensured that the gear unit type, all technical data and the ATEX labelling conform to the planning of the plant or the machine.

The type plate must be firmly attached to the gear unit and must not be subjected to permanent soiling. Please contact the PGR service department if the type plate is illegible or damaged.

EXPLOSION !

Gearboxes that are suitable to 2014/34/EU instruction; have "ATEX" label which is at the standard of EN ISO 80079-36:2016, EN ISO 80079-37:2016 and also proper to stated contents. **An example is given below:**

Figure 2: Gearbox Nameplate and Explanation



Marking according to ATEX (EN ISO 80079-36:2016, EN ISO 80079-37:2016):

1. Group (Always **II**, quarries are not included)
2. Category (for gas **2G-3G**, for powder **2D-3D**)
3. If firing protective type (**c**) is put
4. Implementing explosive group (**IIC, IIB**)
5. Temperature Class (for gas **T1-T3** or **T4**) or maximum surface heat (for example for powder **125°C**) or specific maximum surface heat, look at private documents. (**TX**)
6. Temperature measurement during access to a plant. (**X**)

2.2 Compatibility Declaration

All gear units or gearmotors (when supplied with electric motor) are designed in compliance with the provisions of applicable Essential Health and Safety Requirements, the "Machinery Directive" 2006/42/EC and, if requested, can be supplied with a Manufacturer's Declaration-Annex IIB as provided by said Directive.

EXPLOSION !

The nameplate specifications regarding the maximum surface temperature, refer to readings taken in normal ambient and installation conditions.
Even minimal variations to said conditions (e.g. smaller mounting cabinet) may have a significant effect on the unit's heat output.

2.3 Explanations

Table 3: Product Description

PCD 616 - 10 H X M 165 2.2 kW M1 100 - B5 100L / 4B BRE OG ---

Type: PGR (Cycloid Series Reducers) **PCD**

Case Width
Catalog: PCD
Page : 16

2. Stage - Case Width

H Foot Mounting
V Flange Mounting
F Case Mounting

İges: Reduction Ratio
Catalog: PCD
Page : 16

M With Motor
- Without Motor

X PAM Hollow Shaft Adapter
C C-FACE, Motor Connection With Coupling
W Free Input Shaft

Rated Motor Power

Mounting Position
M1 - M2 - M4

(X) B5: 56, 63, 71, 80, 90, 100, 112, 132, 160, 180, 200

(X) B14: 56, 63, 71, 80, 90, 100, 112, 132

(C) B5: 63, 71, 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280

Lubrication Type

OG Grease
OB Oil Bath
OP With oil circulation

MOTOR

100L Case Width: 63 M, 71 M, 80 M, 90 S/L, 100 L, 112 M, 132 S/M, 160 M/L, 180 M/L, 200 L, 225 M, 250 M, 280 M

4B Number of Poles: 2, 4, 6, 2 - 4, 2 - 8

Other pole combinations on request.

BRE Motor Options: BRE, RG, SR, HL, TF, TW, WU, EF, ZF, DF, IG, KK/FK, B

Catalog: PCD
Page : 17

Special Design

2.4 Abbreviations

Table 4: Abbreviations

Abbreviations	Meaning	Cycloidal Gear Units
H	Foot Mounting	✓
V	Flange Mounting	✓
F	Case Mounted	✓
X	PAM Hollow Shaft Adapter	✓
C	C-FACE, Motor Connection With Coupling	✓
W	Free Input Shaft	✓
M	With Motor	✓

✓ **: Existing designs are marked with a tick.**

2.5 Connection Types

Tablo 5: Connection Types

Single Stage	Double Stage
607	607-07
608	608-07
609	609-08
610	610-08
611	611-08
612	611-09
613	613-08
614	613-09
615	613-10
616	614-08
617	614-09
618	614-10
619	616-09
620	616-10
621	616-11
622	617-09
623	617-10
624	617-11
625	618-10
626	618-13
627	619-11
	619-13
	620-11
	620-13
	621-13
	621-16
	622-13
	622-17
	623-16
	623-18
	624-16
	624-18
	625-17
	625-19
	626-19
	627-19

3.1 Prerequisites of Assembly

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.
Care must be taken that drive elements attached to the gear unit, such as clutches, pulleys etc. and drive motors are also ATEX-compliant.

In applications where an incorrect rotational direction may result in damage or potential risk, the correct rotational direction of the output shaft is to be established by test running the drive when uncoupled and guaranteeing such for subsequent operation.
Gears with integrated return stops are marked with arrows on the drive/driven sides. The arrows point in the rotation direction of the gear unit. When connecting the motor and during motor control, it must be ensured that the gear unit can only operate in the direction of rotation.

NOTE !

For gear units with an integrated back stop, switching the drive motor to the blocked direction of rotation, i.e. incorrect direction of rotation, may result in damage to the gear unit.
Take care that the direction of rotation of the gear unit is correct when connecting the motor and the motor control unit.

Please note that for geared motors (gear units with attached electric motors) the electric motor has its own type plate and separate ATEX designation. The motor labelling must also comply with data for the planning of the plant or the machine.
The lowest explosion protection level on the gear unit and the motor labelling applies for the geared motor unit.
If the electric motor is driven with a frequency inverter, the motor requires ATEX approval for inverter operation. If the motor is operated with an inverter, significant differences between the nominal speeds on the type plates of the motor and the gearbox are normal and permissible. For operation of the motor with the mains supply, differences of the nominal speeds on the motor and the gear unit of up to ± 60 rpm are permissible.

EXPLOSION !

Explosion hazard: Failure to comply may cause severe or even fatal injuries.
- The gear unit may only be operated in the stated version.
- The permissible version is stated on the type plate (IM…). If an X is present in the field IM, the special documentation, whose number is in field S, must be observed. (Section 4.1 "Control and Periodic Maintenance" page 37-38) or the special documentation, shows the configuration of the individual types of gear units.
- It must be checked and ensured that the configuration as stated on the type plate complies with the installation orientation and that the installation orientation does not change during operation.

Please heed the Operating Instructions for the motor, in particular with regard to the chosen version.

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.
- Cycloid gearboxes; the ambient temperature should be fitted temperature values given in the "Lubricant" part.

EXPLOSION !

Bearings, discs, shafts and housings may be damaged due to improper assembly.

- Observe the assembly instructions.
- The push-on gear unit must be fitted onto the shaft using a suitable puller, which will not exert damaging axial forces on the gear unit. In particular, do not hit the gear unit with a hammer.

PATLAMA !

Before access to a plant, those belows should be controlled and be secured:

- During assembly of gearbox, whatever any explosion danger such as due to lubricant, acid, gas and steam radiation, could not be happened and there should not be powder accumulation at gearbox more than 5 mm.
- During operating process, gearbox should be put in a well-vented room and not to be exposed in an effect of substantially heat radiation from outside.
- During operating process, the temperature of cooling air should not exceed 50 °C.
- The plugs and drain valves for the control and discharge of oil and grease must be easily accessible.
- Several other devices belong to gearbox, seperately from their own functions should have an ATEX Certificate. (Protective electrical working substance against explosion)
- The assembly of gearboxes with an output shaft (with or without a friction-inhibiting connection) must be carried out correctly according to the instructions in this manual.
- After set up process is completed, cleaning of gearbox would be required.
- Please be sure that all parts expanding and shifting with help of machine operator or all operating devices which prevent unwanted contacts between gearbox gaskets, would be operativeness.

Assembly and subsequent dismantling is aided by applying an anti-corrosive lubricant to the shaft before fitting. Excess grease or anti-corrosion agent may escape after assembly and may drip off. Clean these points on the driven shaft after a running-in time of approx. 24 hours. This escape of grease is not due to a leak in the gear unit.

DANGER !

Due to the connection equipment installed on the output shaft of our gearbox (coupling, gear, belt-pulley mechanism, etc.) there is a danger of injury:

- Use a cover as a guard.
- If this does not achieve sufficient protection against contact according to the required protection type, the machinery and plant constructor must ensure this by means of special attached components.

DANGER !

The Gear unit must not be mounted in the ambient conditions listed below:

- Explosive atmosphere, high corrosive and / or oils, acids, gases, steams, radiation,
- Places directly contacted to the food.

Gearboxes are either dispatched without motor or motors by ATEX are assembled to a gearbox after getting supplied from electrical motor manufacturer. Electric connection belongs to end user.
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
The connection flanges must be connected to the shaft with the pilot holes opened according to DIN 332.
In cases where an incorrect direction of rotation may cause damage or hazards, the correct direction of rotation of the output shaft should be determined by performing a test run on the gearbox before installation and secured for later operation.
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.

DANGER !

In the one-way locked gear units, the gear unit must be operated at the direction of lock rotation, otherwise the damage could be occured.

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.

EXPLOSION !

Maximum surface temperature states gotten measurements in normal setup and usage conditions.
If the usage conditions of gearbox are different from those, surface temperature could up to higher values.
In that case oil circulating cooling unit must be used.

EXPLOSION !

In case of below actions that were taken, the ATEX Certificate will be invalid.

- Different using other than label values based on the gearbox.
- Use in more dangerous area (explosive environment) other than stated level at the label of gearbox.
- Use of gearbox in the area whose equipment class is I. (quarries under dangerous originated by fire-damp).
- Use of gearbox at diffrent forces apart from gotten one.
- Changing of assembly position.

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.
  (Foot mounting - Flange mounting or Case mounting)
- 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.

ATTENTION !

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 C-FACE, PAM and output shaft.

- 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 PGR.
- 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.
- Depending on the type of used gearbox, all the foot and flange bolts must be used completely. Bolts must be tightened with proper tightening moments.

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 <10 Ω.
Electro-chemical corrosion could be occured between the different metals like cast iron and stainless steel. Also plastic washer should be used in bolts!

DANGER !

-Do not use a standard unit in an explosive atmosphere (which is likely to be filled with explosive gas or steam). Under such conditions, an explosion proof motor should be used; otherwise, electric shock, personal injury, explosion fire, or damage to the equipment may result.
-In the case of a Explosion proof motor, use a motor that has specifications that are appropriate for a dangerous location (a location where gas or volatile vapor is present); otherwise explosion, ignition, electric shock, injury, fire, or equipment damage may result.
-Since the inverter itself is not explosion proof, when a flameproof motor is driven by an inverter install an inverter in a place free from explosive gas; otherwise, electric shock, personal injury, explosion fire, or damage to the equipment may result.




ATTENTION !

-Do not use the products for purposes other than those shown on the nameplate or in the manufacturing specifications; otherwise, electric shock, personal injury, or damage to the equipment may result.
-Do not place flammable objects around the gearmotor; otherwise, fire may result.
-Do not place any object around the gearmotor or reducer that will hinder ventilation.
Insouciant cient ventilation can cause excessive heat build-up that may result in burns or fire.
-Do not step on or hang from the gearmotor or reducer; otherwise injury may result.
-Do not touch the shaft end of the gearmotor or reducer, inside keyways, or the edge of the motor cooling fan with bare hands; otherwise, injury may result.
-When the unit is used in food processing applications, machines for cleanroom and so on, vulnerable to oil contamination, install an oil pan or other such device to cope with oil leakage due to breakdown or failure; otherwise, oil leakage may damage products.
-Always drain oil lubricated models before mounting, moving, and transporting. Moving with lubricating oil in the machine may cause oil to escape from the air vent, etc.

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.

- No explosive atmosphere must be present when installing the gear unit.
- The cooling air supplied to the gear unit/geared motor must be within the permissible temperature range stated on the type plate.
- In case of direct sunlight falling onto the gear unit, the cooling air supplied to the gear unit/geared motor must be at least 10℃ below the highest permissible temperature of the ambient temperature range Tu, which is stated on the type plate.

DANGER !

Danger of Burns:
The surfaces of gear units or geared motors may become hot during or shortly after operation.
Hot surfaces which can be touched directly must be protected with a contact guard.

DANGER !

Damage to the gear unit due to overheating.

The gear unit may be damaged by overheating.

During installation:

- Ensure a free flow of air to all sides of the gear unit.
- Ensure adequate space around the gear unit.
- With geared motors, the cooling air of the motor fan must be able to flow unobstructed onto the gear unit.
- Do not enclose or encase the gear unit/geared motor.
- Do not subject the gear unit to highly energetic radiation.
- Do not direct warm exhaust air from other units onto the gear unit / geared motor.
- The base or flange to which the gear unit is attached must not input any heat into the gear unit during operation.
- Do not allow dust to accumulate in the area of the gear unit
- To prevent overloading of machine equipment which gearbox is connected, supply of extreme current breaker, temperature delimeter, extreme speed monitors etc. equipments by end user is required.
- During operation of urgent stopping system, accumulated energy should be swiftly and securely be distributed or would be isolated the way that no danger is created. Distribution of accumulated energy is related with system connected to the gearbox. Necessary precautions must be taken at those systems.

The base or flange to which the gearbox is connected must be rigid and straight, without vibration, against torsion. (the error of smoothness should be a maximum of 1°)

All contamination to the bolting surfaces of gear unit and base and/or flange must be thoroughly removed. The gear housing must always be earthed. With geared motors, earthing via the motor connection must be ensured.

The gear unit must be precisely aligned with the drive shaft of the machine in order to prevent additional forces from being imposed on the gear unit due to distortion.

It is forbidden to weld the gearbox. The gearbox should not be used as a chassis connection for welding work, otherwise the bearings and discs may be damaged.

The gear unit must be installed in the correct orientation (please see chapter 3.1 "Prerequisites of Assembly" page 23-25) and (please see chapter 4.1 "Control and Periodic Maintenance" page 37-38).

All gear unit feet and/or all flange bolts on each side must be used. Bolts must have a minimum quality of 10.9. The bolts must be tightened to the correct torques (please see chapter 3.3 "Bolt Tightening Torque Value" page 29).
Tension-free bolting must be ensured, particularly for gear units with a foot and flange. Oil checking and oil drain screws must be accessible.



EXPLOSION !

Additional procedures for ATEX units:

- Check all nameplate data to ensure they are consistent with the application: group, category, area, maximum surface temperature, P1, n1 and M2 maximum limits, installation position, ambient temperature.
- Check for the absence of solar radiation or other heat sources.
- In case of expected ambient temperatures <-20 °C or >40 °C contact in advance the Technical Service by PGR.
- Check there are no fumes or abrasive and/or corrosive dust.
- Make sure not to be in close proximity to sources of ultrasound and/or ionizing radiation.
- Check that the facility has adequate protection from lightning fall.
- Check for any leakage of lubricant (if detected, stop the installation and consult the Technical Service by PGR).
- Eliminate any traces of dirt from the shafts and from the areas around the oil seal, using materials that do not generate electrostatic charges.
- Check that the environment has been cleared from the presence of a potentially explosive atmosphere, and that such a condition is maintained for the whole duration of the installation.
- Check that the components connected to the unit at both the input and output are ATEX approved.
- Use the torque arms that can be supplied.
- Ensure proper cooling of the motor through a good flow of air from the fan side; check that there are no obstructions or covers preventing the cooling of the unit.
- Check the accessibility to the warning light (or dipstick) for oil level check.
- Install the unit and connect to appropriate intervention system, any sensor thermal protection, supplied separately and when provided for. Specific instructions are given in the Annex to the manual.



EXPLOSION !

- It is vital to determine surface temperature of unit during operation under conditions provided by implementation. Observation should be repeated periodically as shown at "CONTROL and MAINTENANCE" table.
- The surface temperature must be measured around intake of action or in the connection area between motor and unit and in any case should be at a place where airstream is lesser.
- The difference between measured surface temperature (Ts) plus allowed maximum ambient temperature (Tam) and measured ambient temperature (Ta) would be at least 10 °C lower than allowed maximum surface temperature. (Tc, stated at label): Ts + (Tam-Ta) < Tc -10 C

Please stop operation of gearbox at improper temperatures and be consult to PGR Technical Service.

3.2.1 Installation Location

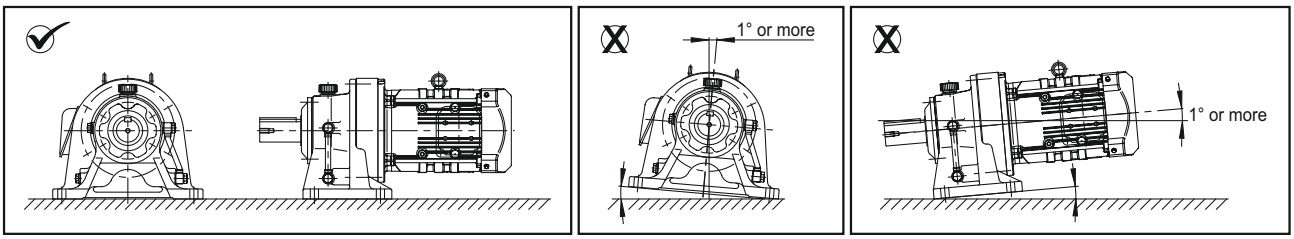
Ambient Temperature: -10 to +50°C
Ambient Humidity : Maximum 85%
Altitude : Maximum 1000 m
Atmosphere : No corrosive or volatile gases, no steam Dust-free, well-ventilated area.
Installation Location : **Indoor type ;** Indoors (area with minimal dust, no contact with water)
Outdoor type; Indoors or outdoors (place where are got wet with common rainwater not but direct heavy wind and rain)
Vibration : Maximum 1G.

- Mounting in conditions other than the above requires adherence to optional specifications. Please consult with us.
- The Gearbox/Gear Motor manufactured according to specifications such as explosion protection can be used in the specified installation environments. However, apply precautions based on the installation environment regarding the connector of the machine being used.
- Mount in a location that enables easy operation, such as inspection and maintenance.
- Install it on a sufficiently solid base.

3.2.2 Mounting Angle

For machines built to a specified mounting angle, only use the specified mounting angle.
Do not remove the motor's eye-bolt. In the rare case that it is removed, insert a bolt or other appropriate material into the screw hole to prevent water or other substances from entering the motor through the screw hole.The gearbox must be installed on the machine in accordance with the selected mounting position.
Lubricants recommended by our company should be used. (see Lubrication Charts, pages 47-53)

Figure 3: Mounting Angle (Example Mount Type)



NOTE !

In non-standard mounting positions of gearboxes with body sizes 613-627, grease lubrication is performed only. Please consult with our company.

3.2.3 When Load Condition Is Critical

In case of excessive vibration or frequent start-stop situations, it is recommended to use a mounting bolt of at least grade 8.8 (JIS B 1051) to absorb the impact on the gearbox foot.

3.3 Bolt Tightening Torque Value

Table 6: Bolt Tightening Moments

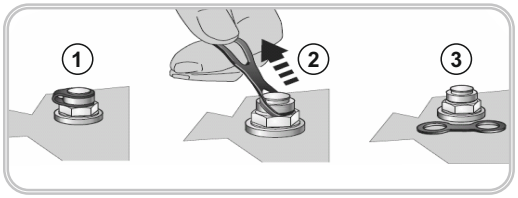
Bolt Tightening Moments [Nm]			
Dimensions	Bolt Quality		
	8.8	10.9	12.9
M4	3.2	5	6
M5	6.4	9	11
M6	11	16	19
M8	27	39	46
M10	53	78	91
M12	92	135	155
M16	230	335	390
M20	460	660	770
M24	790	1150	1300
M30	1600	2250	2650
M36	2780	3910	4710
M42	4470	6290	7540
M48	6140	8640	16610
M56	9840	13850	24130

3.4 Gear Unit Ventilation

Ensure that no aggressive or corrosive substances are present in the area surrounding the installation site or are subsequently expected during operation, which attack metal, lubricants or elastomers. In case of doubt, please contact PGR and take the recommended action.
The pressure vent must be activated prior to commissioning. To activate, remove the transport securing devices.

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. If ventilation plug was sent seperately, it has to be inserted.

Figure 4: Activation of Vent Plug

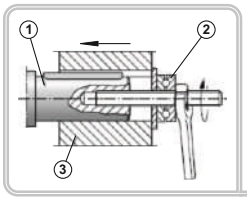


1. The carrying secured ventilation plug,
2. Remove the carrying safety,
3. The ventilation safety is active.

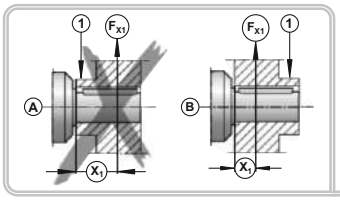
3.5 The Mountage of the Connection Tool to the Output Shaft

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

Figure 5: The Mountage of the Connection Tool to the Output Shaft



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



1) Connection unit
A) False
B) True

* 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.

DANGER !

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.

NOTE !

With smearing a little amount of grease or heating the connection tool in a short-time (80….100 °C), the mounting easiness may be provided.

3.6 Temperature Sticker

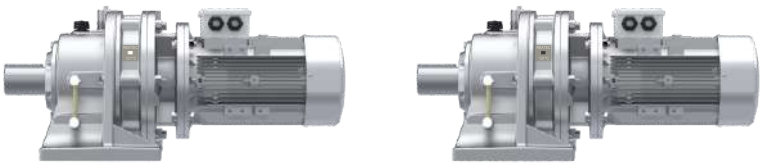
EXPLOSION !

Explosion hazard: due to lack of labelling.
Failure to comply may cause severe, or even fatal injuries.
With temperature class **T4** gear units or gear units with a maximum surface temperature of less than **135 °C**, the supplied self-adhesive temperature sticker (printed with value **121 °C**) must be affixed to the gear unit housing.

The temperature class or the maximum surface temperature can be seen from the ATEX labelling in the last line of the type plate.
Examples: II 2G c IIC T4 X or II 3D 125 °C X

The temperature sticker must be affixed next to the oil level screw and (please see chapter 4.9 "Temperature Measurement" page 41) towards the motor. For gear units with an oil level vessel, the temperature sticker must be affixed in the same position as for gear units without an oil level vessel. For gear units which are lubricated for life, without oil maintenance, the temperature sticker should be affixed next to the type plate.

Figure 6: Temperature Sticker (H)



Midpoint **White:**
Temperature is normal.

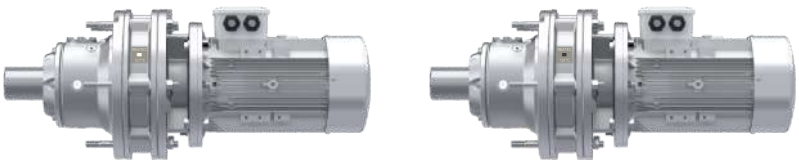
Midpoint **Black:**
Temperature is very high.

Figure 7: Temperature Sticker (V)

Midpoint **White:**
Temperature is normal.

Midpoint **Black:**
Temperature is very high.

Figure 8: Temperature Sticker (F)



Midpoint **White:**
Temperature is normal.

Midpoint **Black:**
Temperature is very high.

3.6.1 Visual Inspection of the Temperature Sticker

EXPLOSION !

Explosion hazard: Failure to comply is likely to cause severe or even fatal injuries.

- Check whether the temperature sticker has turned black.
- If the temperature sticker has turned black, the gear unit has become too hot.

The cause of overheating must be established. Please contact the PGR service department immediately. The drive unit must not resume operation before the cause of overheating has been remedied and renewed overheating can be ruled out. Before putting into operation again, a new temperature-sensitive adhesive label must be attached to the gear unit. Remove dust
(only necessary for category 2D)

EXPLOSION !

Explosion hazard: Failure to comply is likely to cause severe or even fatal injuries.

- Dust deposits on the gear unit housing must be removed if they are more than 5 mm thick.

3.7 Installation of the Cycloid Gearbox on the Machine

ATTENTION !

- Verify the direction of rotation before connecting the gearbox to the driven machine. The wrong turning direction may cause personal injury or damage to equipment.
- When operating the gearbox alone (without connection), remove the key that is temporarily connected to the output shaft; otherwise, the key may pop and injury may occur.
- Close the rotating parts; otherwise, injury may occur.
- When connecting the gearbox to a load, check whether the centering, belt tension and parallelism of the pulleys are within the specified limits. When the gearbox is connected directly to another machine, please check whether the accuracy of the direct connection is within the specified limits. Check the belt tension when the belt is used to connect the gearbox to another machine. Tighten the bolts on the pulley and coupling correctly before starting; otherwise, there is a risk of injury or damage to the products due to scattering of broken parts around.

3.8 Checking Rotational Direction

Figure 9-1: Output Shaft Rotation Direction (Gear Motor)

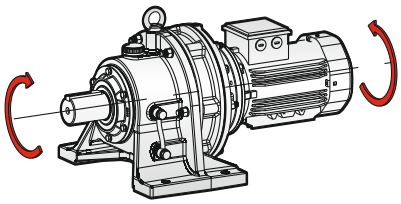
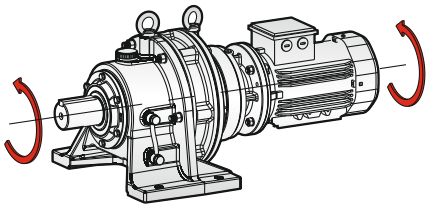
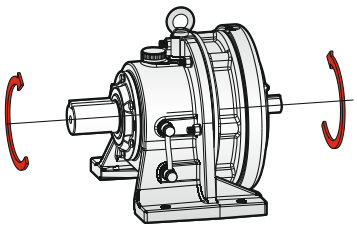
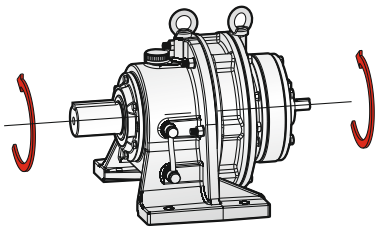
Type of Gearbox	Single Stage - Triple Stage	Double Stage Low reduction ratio series
Output shaft rotation direction		

Figure 9-2: Output Shaft Rotation Direction (Gearbox)

Type of Gearbox	Single Stage - Triple Stage	Double Stage
Output shaft rotation direction	It rotates in the opposite direction of the input shaft.	It rotates in the same direction as the input shaft.
		

3.9 Mounting Fastener

- Do not apply impact or excessive axial load to the shaft when installing the connection equipment on the output shaft.
  The bearing may be damaged or the bearing ring may come off.
- Crimping tools are recommended.

3.9.1 When Using a Coupling;

The alignment accuracy (A, B, X) in figure 10-1 should be no greater than that shown in Table 7.

Figure 10-1: Alignment Accuracy

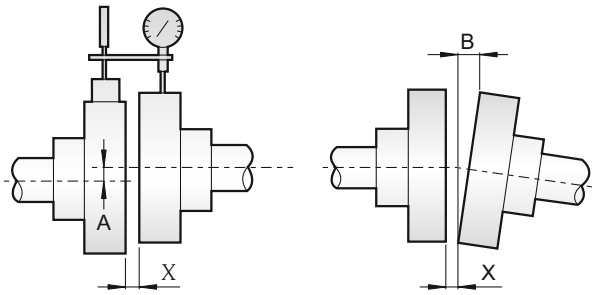


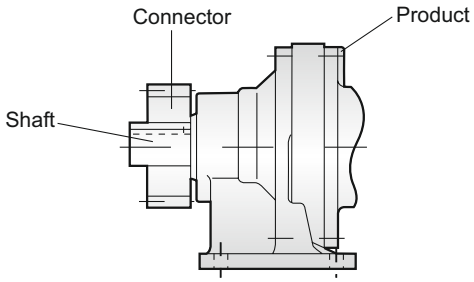
Table 7: Alignment Precision for Flexible Coupling

Allowable Tolerance **A**	0.1 mm or manufacturer-specified value
Allowable Tolerance **B**	0.1 mm or manufacturer-specified value
X	manufacturer-specified value

3.9.2 When Using a Chain, Sprocket or Gear Wheel;

- When using a chain, install the chain tension angle so that it is perpendicular to the shaft.
- Refer to the chain catalog or other references for chain tension.
- The section circle of the chain gear or gear wheel can be a maximum of 3 times larger than the output shaft diameter.
- The working load point of the chain gear or gear wheel should be between the center of the shaft and the gearbox. (see figure 10-2)

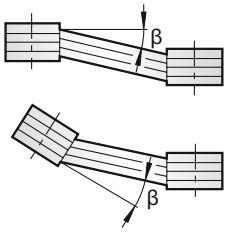
Figure 10-2: When Using a Chain, Sprocket or Gear Wheel



3.9.3 When Using a V Belt;

- Over-tightening the V belt will damage the shaft and bearing. Refer to the V belt catalog or other reference for V belt tension.
- The parallelism, eccentricity β of the two pulleys should be within 20´. (See figure 10-3)
- When using multiple V belts, use a matched set having the same circumferential length.

Figure 10-3: When Using a V Belt



3.10 Installation of a Standard B5 Flanged Motor on a Gearbox with a C-FACE Adapter

1. The motor and the shaft of the motor with the C-FACE Adapter, the flange surfaces should be cleaned and damage control should be carried out. During the installation of the couplings, it should be ensured that all precautions that may damage the motor shaft are taken. The dimensions and tolerances of the motor fastening elements must comply with EN 60079-0.
2. The metal coupling (coupling half-piece) should be heated to a temperature of 80-100℃ and the key should be centered and passed to the motor shaft.
3. The setuskur bolt located on the metal coupling must be tightened. However, before tightening, Loctite 242 or Loxeal 54-03 threadlocker should be applied and the setuskur bolt should be secured. It should be fixed to the motor shaft according to the tightening moment given in the charts. If necessary, the plastics supplied with the coupling for 160, 180, 200, 225, 250, 280 C-FACE adapter types should be placed between the coupling and the shoulder.
4. If the installation is to be carried out outdoors and the environment is humid, it is recommended to isolate the motor flange and C-FACE Adapter surfaces. Loctite 574 or Loxeal 58-14 surface insulation material should be used on the flange surfaces so that the flange is isolated before and after motor installation.
5. The motor must be connected to the C-FACE Adapter, it should be remembered to install the supplied coupling at this time.
6. The C-FACE adapter must be installed according to the appropriate tightening torque. When doing this, it should be made sure that the C-FACE adapter shaft passes into the plastic housing of the coupling without any contractions.

EXPLOSION !

Explosion hazard: Failure to comply is likely to cause severe or even fatal injuries.

- Only standard motors with an adequate ATEX Zone category according to the type plate may be used.
- In addition, for ATEX category 2D gear units (see the ATEX labelling on the last line of the gear unit type plate), the motor must have at least protection class IP6x.

3.11 Installation of Standard B5-B14 Flanged Motor on PAM Gearbox

1. The motor shaft, PAM adapter shaft and flange surfaces should be cleaned and damage control should be performed. The dimensions and tolerances of the motor fastening elements must comply with EN 60079-0.
2. The motor B5-B14 flange must be pushed until it rests on the forehead of the PAM adapter.
3. If the installation is to be carried out outdoors and the environment is humid, it is recommended to isolate the motor flange and PAM Adapter surfaces. Loctite 574 or Loxeal 58-14 surface insulation material should be used on the flange surfaces so that the flange is isolated before and after motor installation.
4. The motor must be connected to the PAM Adapter.
5. The bolts of the PAM adapter must be installed according to the appropriate tightening torque.

EXPLOSION !

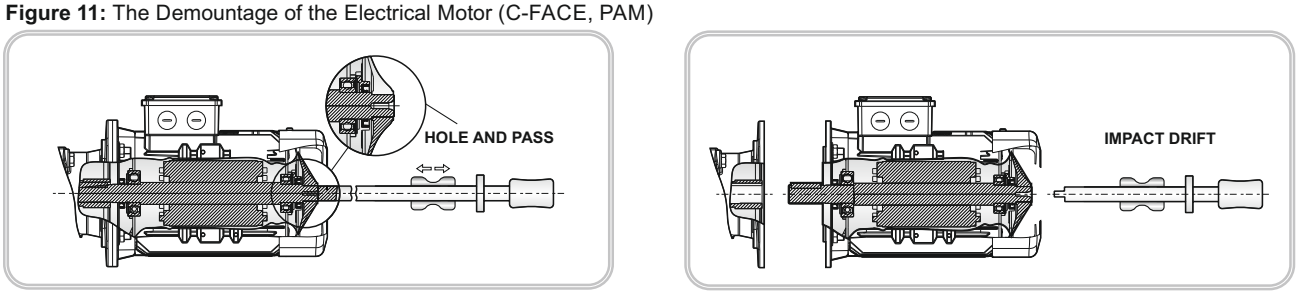
- If all controls that were stated above are positive and all instructions were performed completely/properly, electric motor could be set up with ATEX protection that is suitable to the gearbox and in the same way 2014/34/EU regulation adaptable a gearbox motor could be generated.

Although during the connection of motor and gearbox, in the use of a process which is not stated in this handbox and/or not follow a single or more instructions, the operator should calculate analysis and must define by himself that the risk could emerge from motor-gearbox connection. In the situation of gearbox would be feeding motor, this risk analysis will always be required.
Only just in this manner, complete system would be subject to both certificate of manufacturer and 2014/34/EU regulation adaptable gearbox.

3.12 The Demountage of the Electrical Motor (C-FACE, 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 seperation 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.

Figure 11: The Demountage of the Electrical Motor (C-FACE, PAM)



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. The connection screws batwean the motor and gear unit must be removed.
4. By the help of impact drift inertial force, the motor must be seperated from the gear unit.

The using of slots both in the bodies of PAM and C-FACE, with the help of screwdriver or lever in a way that the motor is not getting harmed, may be removed by pushing back.

3.13 Gear Unit Operating

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.

- For the confirmation of direction of rotation of gear unit, it is needed to be operated before machine mounting.
- The mounting position of the gearbox must be the same as the nameplate.
- There must not be any oil leakage in gear unit.
- There should not be excessive vibration and the acceptable sound level for gearboxes should not be exceeded.
- In case of long-term non-use, proper storage conditions must be met.
- 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 gearbox is shipped without oil, the first oil filling should be done according to the amount of oil specified in the oil tables.
- The gearbox is not allowed to operate in explosion-sensitive areas. However, special motors are available for these conditions. Please consult to our firm.
- When operating the gear unit, the instructions in this operating manual must be complied with.
- The prescribed inspection and servicing intervals must be complied with.
- It must be ensured that the power ratings stated on the type plate are not exceeded. If, e.g. for variable speed drive units, there are several operating points, the maximum permissible drive power P1 or the maximum permissible torque on the driven shaft M2 or the maximum permissible speed must not be exceeded at any operating point. Overload of the gear unit must be ruled out.
- Gear units with an integrated back stop on the drive shaft may only be operated at more than the minimum speed of the gear unit drive shaft, n1min= 900 rpm.
- The painting of the gear unit is designed for Category 2G Group IIB (Zone 1 Group IIB). For use in Category 2G Group IIC (Zone 1 Group IIC) the gear unit must not be used or installed in areas in which processes which cause electrostatic charging are to be expected. This also includes occasional manual rubbing of the gear unit housing; cleaning may only be carried out with a cloth which is moistened with water.
- During operation, if any of the irregularities described in Section (chapter 4.10 page 42) are detected, or the temperature sticker has turned black, the gear unit must be shut down and PGR must be consulted.

4.1 Control and Periodic Maintenance

EXPLOSION !

Explosion hazard: Failure to comply may cause severe or even fatal injuries.
Before commissioning, the oil level must be checked with the supplied dipstick.

DANGER !

Danger of burns due to hot oil:

- Allow the gear unit to cool down before carrying out maintenance or repair work.
- Wear protective gloves.

NOTE!

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.

DANGER !

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.

- 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 occured.
- Worn items only must be changed with original and unused items.
- The lubricators, which recommended by our company, should be used. (see. **Lubrication Table**, page 49-53)
- 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.

All above informations were given for the purpose of efficient and confidential operating of gearboxes.
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.

NOTE !

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.

Table 8: Control and Periodic Maintenance Ranges - Works

Control and Periodic Maintenance Ranges	Control and Periodic Maintenance Works
Once at every 3000 work hours or once at every 6-months until the .	- Visual inspection - Check for running noises - Check oil level - Additional lubrication with grease (in certain W and C-FACE options applications)
1. If the daily working time is a maximum of 10 hours; one in every 3-6 months. **2.** If the daily working time is a maximum of 10-24 hours; one in every 500-1000 working hours. **3.** One in after every 20000 working hours or; 3-5 years.	- Maintenance-free Grease replacement (**3.**) - Re-grease change (**1.2.3.**)
1. If the daily working time is a maximum of 10 hours; one in 6 months. **2.** If the daily working time is a maximum of 12-24 hours; one in 2500 working hours. **3.** In high temperature and heavy working conditions; every 1 to 3 months.	- Change the oil (**1.2.3.**) - Replacement of the ventilation plug (**1.2.3.**)
At least every 10 years.	- General overhaul.

4.2 Visual Inspection

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.
All work, e.g. transportation, storage, installation, electrical connection, commissioning, servicing and maintenance must be performed in a non-explosive atmosphere.

The drive unit must be inspected and may only be installed if:

- No damage, e.g. due to storage or transport is apparent. In particular the radial seals, the sealing caps and the covers must be inspected for damage.
- No leakage or no oil loss is visible.
- No corrosion or other indications of incorrect or damp storage is apparent.
- The packaging material has been completely removed.

The PAM and W input shaft bearings of the gear unit are the double capped bearings which form interruption. (ZZ or 2RS) These are with the inner ring, form long sealing space. By this way the bearing operates almost frictionlessly. Losses could be minimized and in these bearings the temperature rises could not be seen.

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.

4.3 Check for Running Noises

EXPLOSION !

Explosion hazard: Failure to comply is likely to cause severe or even fatal injuries.
If the gear unit produces unusual running noises and/or vibrations, this could indicate damage to the gear unit. In this case the gear should be shut down and a general overhaul carried out.

Visual inspection of the temperature sticker;
Only necessary for temperature class **T4** or max. surface temperature **< 135 °C**.

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.
If any irregularities are seen during controlling which were explained above, should be consulted to PGR and gearbox has to be stopped immediately.

4.4 Checking the Level of Grease or Oil

- 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.
- The amount of grease in the gearbox should be checked, and if it is deficient, it should be filled

EXPLOSION !

Explosion hazard: Failure to comply is likely to cause severe or even fatal injuries.
The gear unit must be checked for leaks. When checking, care should be taken not to overlook traces of oil or grease outside the gearbox. In particular, the radial seals, cover caps, screw plugs, hoses and housing joints should be checked.

If leaks are suspected, the gear unit should be cleaned, the oil level checked and checked again for leaks after approx. 24 hours. If a leak is confirmed (dripped oil), the gear unit must be repaired immediately. Please contact the PGR service department.
If the gear unit is equipped with a cooling coil in the housing cover, the connections and the cooling coil must be checked for leaks. If there are any leaks, these must be repaired immediately. Please contact the PGR service department.

4.5 Grease or Oil Change

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.
When changing oil or filling for the first time, the type of lubricant stated on the type plate must be used.

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.

NOTE !

Because of the coldness of oil will affected the flowing and venting, the gear unit must not be cooled fully.

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 cataloque. (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.

NOTE !

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.

If the lubrication of the gearbox is done with grease, the properties of the grease in the gearbox and the properties of the grease to be added should be the same.
Mixing of different greases should not be allowed. During the grease change, it should be made sure that the inside of the gearbox is completely filled with new grease.

4.6 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, 2/3 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.

4.7 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.

4.8 Oil Plugs Squeezing Torc Chart

Table 9: Oil Plugs Squeezing Torc Chart

Plug	Torc [Nm]
1/8”	3.5
1/4”	7
3/8”	7
1/2”	12

4.9 Temperature Measurement

The details of the ATEX temperature class or the maximum surface temperature are based on normal installation conditions (please see chapter 3.6 "Temperature Sticker" page 31). Even small changes to the installation conditions can have a significant effect on the temperature of the gear unit.

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.
On commissioning, a surface temperature measurement of the gear unit must be made under maximum load. (This does not apply to gear units which are labelled as temperature class **T4** or a maximum surface temperature of **130 °C** in the last line of the type plate.)

For the temperature measurement, a normal temperature measuring device is required, with a measurement range from 0 °C to 130 °C and a precision of at least ± 4 °C and which enables the measurement of the surface temperature and the temperature of the air. Temperature measurement procedure:

1. Allow the gear unit to run at maximum speed under maximum load for approx. 4 hours.
2. Following warm-up, the temperature of the gear unit housing surface "T_{gm}" must be measured close to the temperature indication label .
3. Measure the temperature of the air "T_{um}" in the immediate vicinity of the gear unit.

EXPLOSION !

Explosion hazard: Failure to comply may cause severe, or even fatal injuries.
The gear unit must be shut down and PGR must be consulted if any of the following criteria do not apply.

- The measured air temperature "T_{um}" is within the permissible range stated on the type plate;
- The measured temperature of the surface of the gear unit housing "T_{gm}" is below 121 °C and the temperature indication label has not turned black (see Figure 12-1,12-2).
- The measured temperature of the surface of the gear unit housing plus the difference between the highest permissible air temperature "T_u" stated on the type plate and the measured air temperature must be at least 15 °C lower than the maximum permissible surface temperature, i.e.:

ATEX labelling:	II 2G Ex h IIC T4 Gb :	$T_{gm} + T_u - T_{um} < 135\ °C - 15\ °C$
ATEX labelling:	II 2D Ex h IIIC T120°C Db :	$T_{gm} + T_u - T_{um} < T_{max} - 15\ °C$

T_{gm} : Measured temperature of the surface of the gear unit housing in °C
T_{um} : Measured air temperature in °C
T_{max} : Maximum surface temperature according to gear unit type plate (ATEX labelling) in °C
T_u : Upper value of the permissible ambient temperature range according to the type plate in °C

Figure 12-1: Temperature Sticker White (H-V-F)

Midpoint **White:** Temperature is normal.

Figure 12-2: Temperature Sticker Black (H-V-F)

Midpoint **Black:** Temperature is very high.

4.10 Checking the Gear Unit

During a test run under full load, the gear unit should be checked for:

- Unusual noises, such as grinding, knocking or rubbing noises,
- Unusual vibrations, oscillations or other movements,
- Production of steam or smoke.
- After the test run, it should be checked if there are any oil or grease leaks on or around the reducer.

4.10.1 Checklist

Table 10: Checklist

CHECKLIST	
Subject of Check	**Information see Section**
Is any transportation damage or damage apparent?	**4.2**
Does the labelling on the type plate conform to the specifications?	**2.1**
Does the configuration on the type plate conform to the actual installation?	**3.1**
Is the pressure vent screwed in?	**3.4**
Are the external gear shaft forces within permitted limits (chain tension)?	**3.1**
Are contact guards fitted to rotating components?	**4.8**
Does the motor also have a relevant ATEX approval?	**4.1**
Is the temperature sticker affixed?	**3.6**
Has the correct oil level for the configuration been checked?	**4.1** **4.4**
Has the temperature measurement been carried out?	**3.6** **3.6.1**
Has the centre of the temperature sticker turned black?	**4.9**

4.11 The Bearing Greases

- To the bearings of motorized gearboxes, greases should be used which are available at the grease table given by our company.
- Our company (PGR) recommends also replacing of grease while changing lubricant at the greased bearings.

4.12 General Overhaul

EXPLOSION !

Explosion hazard: Failure to comply is likely to cause severe or even fatal injuries.

- No explosive atmosphere must be present during servicing and repair work. Servicing and maintenance work must only be performed by qualified specialist personnel.
- When cleaning the gear unit, do not use procedures or materials which may cause electrostatic charging of the gear unit or adjacent non-conducting components.

ATTENTION !

Severe personal injury:

- Severe injury and material damage may be caused by incorrect servicing and maintenance work.
- Servicing and maintenance work must only be performed by qualified specialist personnel. Wear the necessary protective clothing for servicing and maintenance work (e.g. industrial footwear, protective gloves, goggles, etc.)

With Category 2G and 2D gear units, a general overhaul is necessary after a specified longer period of operation. The specification of the operating period in terms of operating hours, after which a general overhaul must be carried out, can be seen from the type plate data in field MI.

Alternatively, the maintenance class C_M can be used to determine the operating period after which a general overhaul must be carried out. The data in field MI of the type plate is then e. g.: MI $C_M = 5$.

The time for the general overhaul with the stated maintenance class C_M is calculated as follows:

$N_A = C_M \quad f_L \quad k_A$

N_A : Number of years since commissioning. With calculated values of N_A which exceed 10 years, a general overhaul is due 10 years after commissioning.

C_M : Maintenance class according to field MI of the type plate.

f_L : Running time factor.

$f_L = 10$	Running time maximum 2 hours per day
$f_L = 6$	Running time 2 to 4 hours per day
$f_L = 3$	Running time 4 to 8 hours per day
$f_L = 1.5$	Running time 8 to 16 hours per day
$f_L = 1$	Running time 16 to 24 hours per day

k_A : Utilisation factor

If the utilisation factor is not known , $k_A = 1$

ATTENTION !

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 PGR service.

Longer maintenance intervals often result if the actual power required by the application is known. The utilisation factor may be calculated as follows:

$$k_A = \left(\frac{P_1}{P_{tat}} \right)^3$$

P_1 : max. permissible drive power or motor power in kW according to the type plate.
P_{tat} : actual drive power or motor power in kW which is required by the application at the nominal speed. This is determined e. g. by measurements.

For variable loads with differing actual drive powers with nominal speeds P_{tat1}, P_{tat2}, P_{tat3}, … with known percentage times q_1, q_2, q_3, … the following equivalent average drive power applies:

$$P_{tat} = \sqrt[3]{P_{tat1}^3 \cdot \frac{q_1}{100} + P_{tat2}^3 \cdot \frac{q_2}{100} + P_{tat3}^3 \cdot \frac{q_3}{100} + \ldots}$$

PATLAMA !

Explosion hazard: Failure to comply may cause severe or even fatal injuries.

- The general overhaul must be carried out by qualified personnel in a specialist workshop with appropriate equipment in observance of national regulations and laws. We urgently recommend that the general overhaul is carried out by PGR Service.

If a general overhaul is due, the gear unit must be completely dismantled. The following work must be carried out:

- 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 with orginal part.
- 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.

4.13 The Maintenance of the Motor

Our firm recommends to change the grease in greased bearings.
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.

4.14 Daily Periodic Maintenance

DANGER !

- Do not touch the gearbox when there is a voltage on the cables. Be sure to turn off the power while working on the gearbox; otherwise, an electric shock may occur.
- To any part rotating during the maintenance or inspection of the gearbox during operation (output shaft, etc.) do not approach or touch; loose clothing may get stuck in these rotating parts and may cause serious injury or death.
- Customers should not disassemble explosion-proof motors or exchange parts, otherwise an explosion, ignition, electric shock or damage to the equipment may occur.
- The installation of explosion-proof motors must be carried out in accordance with the electrical codes of the plant, the motor manual and the operating maintenance instructions; Also, do not open the terminal box cover during operation, otherwise an explosion, ignition, electric shock or damage to the equipment may occur.
- Do not operate the machine while the brake is disabled; otherwise, a fall, out of control or damage to the equipment may occur.

ATTENTION !

- Do not insert your fingers or foreign objects into the gearbox and its components; otherwise, electric shock, injury, fire or damage to the equipment may occur.
- The gearbox gets very hot during operation. Touching the gearbox with bare hands can cause serious burns.
- Do not touch the terminals when measuring the insulation resistance; otherwise, an electric shock may occur.
- Do not operate the gearbox without a safety cover (removed during inspection) to protect the rotating parts, otherwise loose clothing may get stuck in these rotating parts and cause serious injury or death.
- Identify and correct any abnormalities observed during the study immediately according to these usage and maintenance instructions. Do not operate until the cause of the abnormality is understood and the abnormality is corrected.
- Replace the lubricant according to these usage and maintenance instructions. Be sure to use the lubricant recommended by the factory.
- Only assemble, transport or transport lubricated models with lubricating oil removed. Moving when there is lubricating oil inside the machine, through the ventilation hole of the oil, etc. it could cause it to leak.
- Do not change the lubricant during operation or immediately after it stops working; otherwise, burns may occur.
- According to these usage and maintenance instructions, provide grease to/from the motor bed/bearings/-unload. Avoid contact with rotating parts; otherwise, injury may occur.
- Do not start damaged gearmotors or gearboxes; otherwise, injury, fire or damage to equipment may occur.
- Since it is outside the scope of warranty, our company does not accept any responsibility for damage or injuries caused by unauthorized changes made by the customer.
- Dispose of the lubricant of the products as general industrial waste.
- When measuring the insulation resistance of explosion-proof motors, make sure that there is no gas or other vaporized explosive material around the unit to prevent explosion or ignition.
- Replacing brake pads requires experience. Please consult the nearest authorized service station.
- The brake torque will vary according to the working environment and conditions, the condition of the friction surface and other factors. In particular, the brake torque may not be at the predicted level at the first start and after a long period of inactivity. In such a case, turn the brake on and off under as light a load as possible so that it contacts the friction surfaces of the brake.

4.14.1 What Needs to Be Done in Daily Periodic Maintenance

Make sure that you make daily inspections in accordance with Table 11. Neglect of inspections is a source of problems.

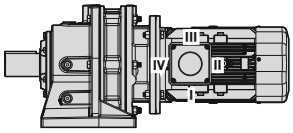
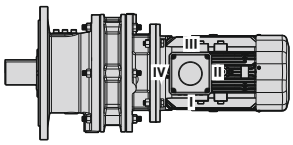
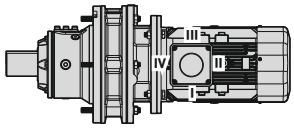
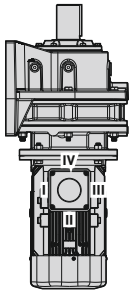
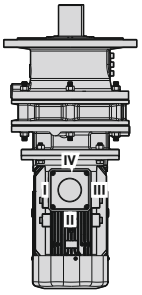
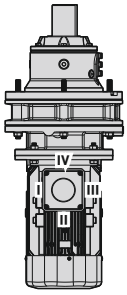
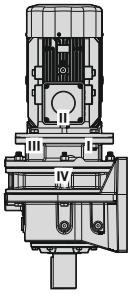
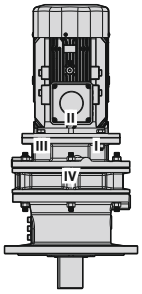
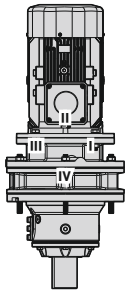
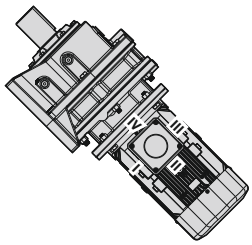
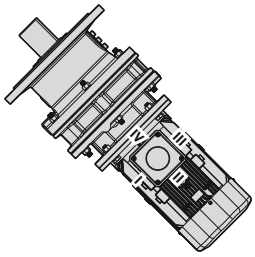
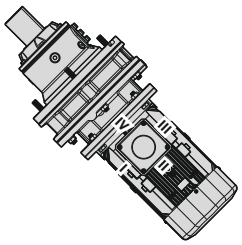
If any abnormalities are detected during the daily examination, “7. Troubleshooting” (Pages, 58-59). If these actions do not solve the problem, contact the nearest authorized service station immediately.

Table 11: Daily Inspection

INSPECTION ITEM		INSPECTION DETAIL
Current Value		Is the current greater than the nominal value shown on the product label? Check it out.
Noise		Are there any unusual sounds or extreme changes in sounds? Check it out.
Vibration		Is there an abnormally large vibration? Are there any extreme changes? Check it out.
Surface Temperature		Is the surface temperature unusually high? Has there been a sudden rise? Temperature increases during operation will differ depending on the model and type. However, the difference between the gearbox surface temperature and the ambient temperature should be about 60°C. For the 607-...-612 Series, this value should be about 40 Dec.
Oil Level (Oil lubricated machines)	**When the gearbox is not working**	Is the oil level below the red line at the top of the oil indicator when the machine is stopped? If the oil level is below the upper red mark while stationary, fill in the lubricating oil up to the mark.Do not add while the machine is running.
	When the gearbox is working	Is the oil level significantly different from the level during stable operation? The red mark at the bottom is an auxiliary sign that serves as a guide to check the oil level while the machine is running.
	Trochoid Pump Type	Are the oil signal and flow indicator working properly? The fact that they do not work properly is a sign that gearbox lubrication is inappropriate due to factors such as insufficient oil, pump damage and blocked pipes. Stop the machine immediately and examine it.
Lubrication Pollution		Is the lubricating oil contaminated? In order to control oil pollution, in addition to removing oil while the machine is stopped, it is also possible to carry out control using the oil indicator. If the oil indicator is polluted, replace it immediately.
Oil-Grease Leaks		Is there an oil or grease leak from the gearbox? Are the sliding surfaces of the oil seal worn out?
Mounting Bolts		Are the mounting bolts loose?
Chain, V Belt		Is the chain or V-belt loose?

5.1 Mounting Positions

Figure 13: Mounting Positions

	H Foot Mounting	V Flange Mounting	F Case Mounting
M1			
M2			
M4			
MX			

MX: Nonstandart montage position (607 - 612)

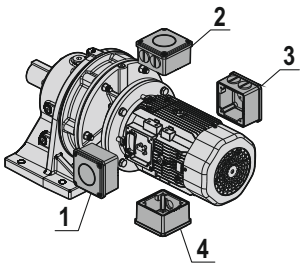
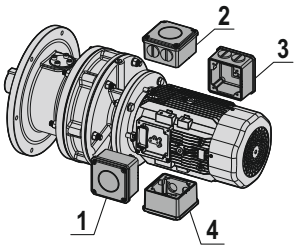
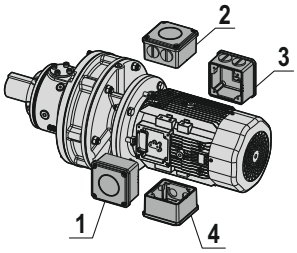
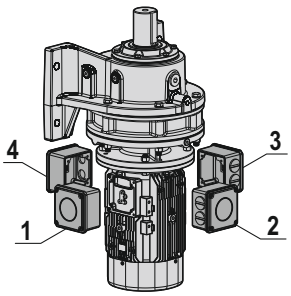
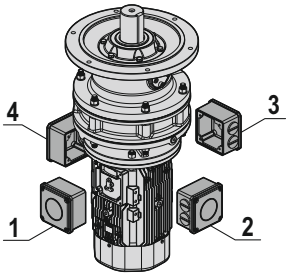
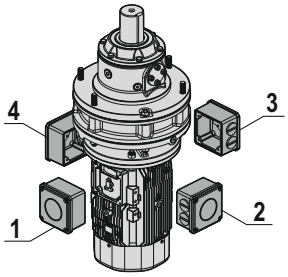
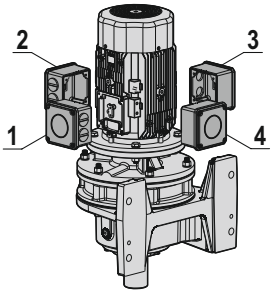
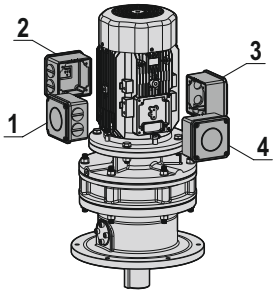
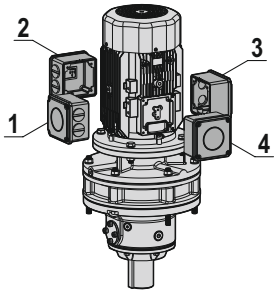
* The reducers with case dimesion between 607 and 612 are suitable for nonstandart mounting position.
* At case dimensions above 613, for nonstandart mounting positions, lubrication need to done by only grease. Pleaseconsult to PGR

- The mounting positions whichis given at table are also valid for X, C, W connected reducers.

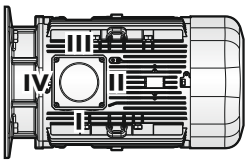
5.2 Terminal Box and Cable Entrance Sides

- In the case of specific requirements, when ordering, specify the position of the terminal box as shown in the diagram.
- Unless specified otherwise, the standard positions are M1.
- Unless other wise specified, the gear reducer is supplied with terminal box in position 1.
- For positions not envisaged, it is necessary to call our Technical Service.

Figure 14: Terminal Box and Cable Entrance Sides

	TERMINAL BOX AND CABLE ENTRANCE SIDES		
	H **Foot Mounting**	**V** **Flange Mounting**	**F** **Case Mounting**
M1			
M2			
M4			

* **1 - 2 - 3 - 4 :** Shows terminal box position.
* **I - II - III - IV:** Shows cable entry position.



6.1 Lubrication

Gearboxes are shipped with oil or grease unless otherwise requested by the customer. The lubricated gearboxes are supplied with a ventilation plug, an oil level kit and a discharge plug, while the greased gearboxes are supplied with a greaser and a blind plug. The actual mounting positions must be specified in customer orders. Lubrication with oil the internal components of the gearboxes are lubricated in oil or by splashing. In the charts given, the amount of oil that needs to be placed according to the different mounting positions and the plug positions are determined accordingly. In some cases, there is a slight possibility of loss other than the amounts of oil and grease given in the chart.

DANGER !

In the situations of not using the stated amount of oil-grease out of the table the probability of emerging a damage at the gearbox could be high.

6.2 Lubrication with Grease

Standart greases are suitable for degrees between -10°C and +50°C. For this reason, the difference between the gearbox surface temparature and ambient temperature should be about 60°C in case of continuous operation when operating at high temperature values or using diffrent type of oil, please kindly consult PGR.

6.2.1 Maintenance Free Grease Lubrication

Lubricated whit grease for life for usage of all mounting positions. Please kindly do not for adding grease.
It will provide an average of 20.000 operating hours or 5 years of operating life.

6.2.2 Relubrication whit Grease

After 500 hours of operation or 2 months of operation, it should be lubricated with grease again. The grease in the reducer provides 2 years of operation under normal conditions without any problem. However, due to the variability of working hours, we recommend changing the grease every 3 to 6 months. When relubricating whit grease, the properties of the oil in the gearbox should be same whit the oil which will be added.
Please kindly do not allow to mix different types of greases.

When changing the grease, it must be ensured that the gear unit is completely filled whit new grease.

Table 12: Recommended Grease

Type of Gearbox	Type of Lubricant	Ambient Temp.°C	Manufacturer	Description
Cycloid Series Reducers	Grease	- 10...50	**SHELL**	Gadus S2 V100 2
		- 10...50	**MOBIL**	UNIREX N2

6.3 Lubrication whit Oil Baht

All lubrication oils that meet the requirements of DIN 51517 part 3 are suitable. Depending on the ambient or operating temperature, according to DIN 51519, the viscosity class should be selected.

Table 13: Oil Change Interval

Oil Change Interval	
The First Oil Change;	after 500 working hours or after 6 months, whichever is first
If the daily working time is a maximum of 10 hours;	one in every 6 months
If the daily working time is a maximum of 12-24 hours;	one in every 2500 working hours
In high temperature and heavy working conditions;	one in every 1 to 3 months

Oil degrades more rapidly when ambient temperature is high or changes radically, and when corrosive gases are present. In suchcases confer with the lubricating oil manufacturer.

Table 14: Working Temperatures

Lubricant as per DIN 51517 part 3	Working Temperatures ˚C Ambience -20˚ 0˚ +20˚ +40˚ +60˚ +80˚ +100˚ +120˚
ISO VG 68	
ISO VG 100	
ISO VG 150	
ISO VG 220	
ISO VG 320	

Table 15: Recommended Oils

Type of Gearbox	Type of Lubricant	Ambient Temp.°C	ISO viscosity class	SHELL	MOBİL	BP	ESSO	DEA	ARAL	CASTROL	TRIBOL	KLÜBER
Cycloid Series Reducers	Mineral oil	- 5...40 Normal	ISO VG 220	Shell Omala Oel 220	Mobilgear 600 XP 220	Energol GR-XP 220	Spartan EP 220	Deagear DX SAE 85W-90 Falcon CLP 220	Degol BG 220	Alpha SP 220 Alpha MW 220 Alpha MAX 220	Tribol 1100/220	Klüberoil GEM 1-220
		-15...25	ISO VG 100	Shell omala Oel 100	Mobilgear 600 XP 150	Energol GR-XP 100	Spartan EP 100	Deagear DX SAE 80W Falcon CLP 150	Degol BG 100	Alpha SP 100 Alpha MW 100 Alpha MAX 220	Tribol 1100/100	Klüberoil GEM 1-100
		# - 50...-15	ISO VG 15	Shell Tellus Oel T 15	Mobil DTE 10 Excel 15	Bartran HV 15	Univis J 13	Alrkraft Hydraulic Oil 15	Vitamol 1010	Hyspin AWS 15 Hyspin SP 15 Hyspin ZZ 15	Tribol 770	Isoflex MT 30 rot
	Synthetic oil	- 25...80	ISO VG 220	Shell Tivela Oel WB	Mobil Glygoyle 30	Enersyn SG-XP 220	ESSO Glycolube 220	Polydea PGLP 220	Degol GS 220	Alphasyn PG 220	Tribol 800/220	Klübersynth GH 6 - 220
	Bio-degradable oil	- 25...80	ISO VG 220					Plantogear 220 S	Bio-Degol S 220	Carelube GES 220	Tribol Bio Top1418/220	Klüber - Bio GM 2 - 220
	Food-grade oil	- 25...80	ISO VG 220	Cassida 220	Mobil SHC Cibus 220		GEAR OIL FM 220	Renolin 220	Degol FG 220	OPTIMOL optileb GE 220	Tribol Food Proof 1810/220	Klüberoil 4UH1 - 220

6.4 Standard Lubrication Method

Table 16-1: Single Stage Lubrication Chart

SINGLE REDUCTION																					
Type	**607**	**608**	**609**	**610**	**611**	**612**	**613**	**614**	**615**	**616**	**617**	**618**	**619**	**620**	**621**	**622**	**623**	**624**	**625**	**626**	**627**
Horizontal Type	Grease lubrication without maintenance						Lubrication with oil bath														
Vertical Type	Grease lubrication without maintenance						Lubrication with oil bath			Forced (Circulating) lubrication											**TP**

Table 16-2: Double-Stage Lubrication Chart

DOUBLE REDUCTION							
Type	**607-07 608-07 609-08**	**610-08 611-08 611-09**	**613-08 613-09 613-10**	**614-08 614-09 614-10**	**616-09 616-10**	**617-08 617-10**	**618-10**
Horizontal Type	Grease lubrication without maintenance		Grease lubrication				
Vertical Type	Grease lubrication without maintenance		Grease lubrication				

Table 17: Lubrication Chart with Double-Stage Oil Bath

DOUBLE REDUCTION												
Type	**616-11**	**617-11**	**618-13**	**619-11 619-13**	**620-11 620-13**	**621-13 621-16**	**622-13 622-17**	**623-16 623-18**	**624-16 624-18**	**625-17 625-19**	**626-19**	**627-19**
Horizontal Type	Lubrication with oil bath											
Reduction Ratio	~ 473	~ 841	~ 1015	~ 2065	~ 2537							Forced (Circulating) lubrication/ (TP)
Vertical Type	Forced (Circulating) lubrication											
Reduction Ratio	559 ~	1003 ~	1247 ~	2537 ~	3045 ~							
	Grease lubrication											

*** TP: with external pump**

* The products which may be given as oil bath or circulating lubrication may be given as grease lubrication upon request.

6.5 Amount of Lubrication

The below oil amounts are approximate. The oil level of the reducer must be followed from the oil level indicator. In addition, geraboxes which is sent without oil should be filled with amount of oil which is indicated on lebel.

Table 18-1: Amount of Grease ((Single Reduction) ~ (gr))

SINGLE REDUCTION						
Type	**607**	**608**	**609**	**610**	**611**	**612**
Reduction portion	25	25	90	140	330	330
Output shaft bearing portion	35	35	100	100	120	120

Table 19-1: Quantity of Oil in Litres ((Single Reduction) ~ (l))

SINGLE REDUCTION									
Type	**H Foot Mounting**			**V Flange Mounting**			**F Case Mounting**		
	M1	**M2**	**M4**	**M1**	**M2**	**M4**	**M1**	**M2**	**M4**
607	G	G	G	G	G	G	G	G	G
608	G	G	G	G	G	G	G	G	G
609	G	G	G	G	G	G	G	G	G
610	G	G	G	G	G	G	G	G	G
611	G	G	G	G	G	G	G	G	G
612	G	G	G	G	G	G	G	G	G
613	0.7	G	G	0.7	G	1.1	0.25	G	0.5
614	0.7	G	G	0.7	G	1.1	0.25	G	0.5
615	0.7	G	G	0.7	G	1.1	0.25	G	0.5
616	1.4	G	G	1.4	G	1.0	0.9	G	0.7
617	1.9	G	G	1.9	G	1.9	1.5	G	1.5
618	2.5	G	G	2.5	G	2.0	1.3	G	1.0
619	4.0	G	G	4.0	G	2.7	2.0	G	1.5
620	5.5	G	G	5.5	G	5.7	3.0	G	3.0
621	8.5	G	G	8.5	G	7.5	4.0	G	3.7
622	10.0	G	G	10.0	G	10.0	5.0	G	5.0
623	15.0	G	G	15.0	G	12.0	7.5	G	6.0
624	16.0	G	G	16.0	G	15.0	8.0	G	7.5
625	21.0	G	G	21.0	G	42.0	11.0	G	22.0
626	29.0	G	G	29.0	G	51.0	14.0	G	26.0
627	56.0	G	G	56.0	G	60.0	30.0	G	33.0

Table 18-2: Amount of Grease ((Double Reduction) ~ (gr))

DOUBLE REDUCTION																	
Type	**607-07**	**608-07**	**609-08**	**610-08**	**611-08**	**611-09**	**613-08**	**613-09**	**613-10**	**614-08**	**614-09**	**614-10**	**616-09**	**616-10**	**616-11**	**617-09**	**617-10**	**617-11**
1.Stage, Reducer part	25					90	25	90	140	25	90	140	90	140	330	90	140	330
2.Stage, Reducer part	25		90	140	330	450							750			1000		
2.Stage, Output shaft bearing part	35	35	100	100	120	300										500		

DOUBLE REDUCTION																
Type	**618-10**	**618-13**	**619-11**	**619-13**	**620-11**	**620-13**	**621-13**	**621-16**	**622-13**	**622-17**	**623-16**	**623-18**	**624-16**	**624-18**	**625-17**	**625-19**	**626-19**
1.Stage, Reducer part	140	450	330	450	330	450		750	450	1000	750	1100	750	1100	1000	1500	1500
2.Stage, Reducer part	1100		1500		1500		2000		2500		4000		4500		6000		8000
2.Stage, Output shaft bearing part	600		700		700		800		900		1000		1100		1200		1300

Tablo 19-2: Quantity of Oil in Litres ((Double Reduction) ~ (l))

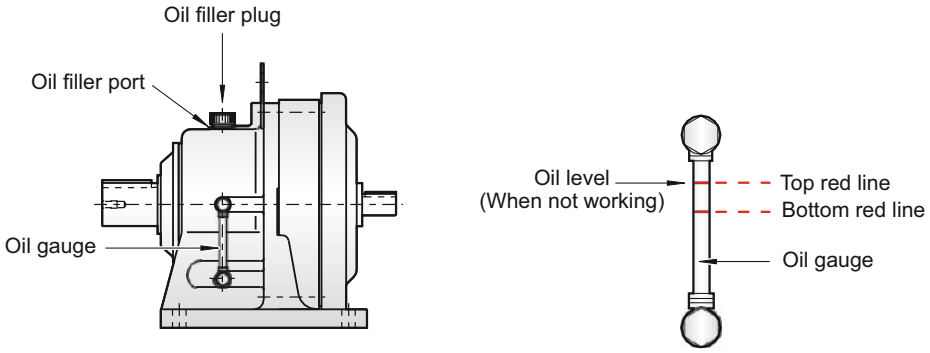
DOUBLE REDUCTION									
Type	**H Foot Mounting**			**V Flange Mounting**			**F Case Mounting**		
	M1	**M2**	**M4**	**M1**	**M2**	**M4**	**M1**	**M2**	**M4**
607 - 07	G	G	G	G	G	G	G	G	G
608 - 07	G	G	G	G	G	G	G	G	G
609 - 08	G	G	G	G	G	G	G	G	G
610 - 08	G	G	G	G	G	G	G	G	G
611 - 08	G	G	G	G	G	G	G	G	G
611 - 09	G	G	G	G	G	G	G	G	G
613 - 08	G	G	G	G	G	G	G	G	G
613 - 09	G	G	G	G	G	G	G	G	G
613 - 10	G	G	G	G	G	G	G	G	G
614 - 08	G	G	G	G	G	G	G	G	G
614 - 09	G	G	G	G	G	G	G	G	G
614 - 10	G	G	G	G	G	G	G	G	G
616 - 09	G	G	G	G	G	G	G	G	G
616 - 10	G	G	G	G	G	G	G	G	G
616 - 11	1.5	G	G	1.5	G	1.0	1.0	G	0.8
617 - 09	G	G	G	G	G	G	G	G	G
617 - 10	G	G	G	G	G	G	G	G	G
617 - 11	2.4	G	G	2.4	G	1.9	2.0	G	1.7
618 - 10	G	G	G	G	G	G	G	G	G
618 - 13	3.5	G	G	3.5	G	2.0	2.3	G	1.5
619 - 11	5.8	G	G	5.8	G	2.7	3.8	G	2.0
619 - 13	6.0	G	G	6.0	G	2.7	4.0	G	2.0
620 - 11	5.8	G	G	5.8	G	11.0	3.8	G	7.0
620 - 13	6.0	G	G	6.0	G	11.0	4.0	G	7.0
621 - 13	10.0	G	G	10.0	G	14.0	5.5	G	8.0
621 - 16	10.0	G	G	10.0	G	14.0	5.5	G	8.0
622 - 13	11.0	G	G	11.0	G	18.0	6.0	G	9.0
622 - 17	11.0	G	G	11.0	G	18.0	6.0	G	9.0
623 - 16	17.0	G	G	17.0	G	23.0	9.5	G	12.5
623 - 18	17.0	G	G	17.0	G	23.0	9.5	G	12.5
624 - 16	18.0	G	G	18.0	G	29.0	10.0	G	16.5
624 - 18	18.0	G	G	18.0	G	29.0	10.0	G	16.5
625 - 17	23.0	G	G	23.0	G	42.0	13.0	G	24.0
625 - 19	23.0	G	G	23.0	G	42.0	13.0	G	24.0
626 - 19	32.0	G	G	32.0	G	51.0	17.0	G	30.0
627 - 19	70.0	G	G	70.0	G	60.0	44.0	G	40.0

6.6 Oil Fill Procedure

6.6.1 Oil Fill Procedure for Horizontal Type

1. Remove the filler plug.
2. Pour oil into the oil filler port, keeping an eye on the oil gauge to check the oil level.
3. Confirm that the oil level is up to the top red line on the oil gauge.
4. Replace the filler plug.

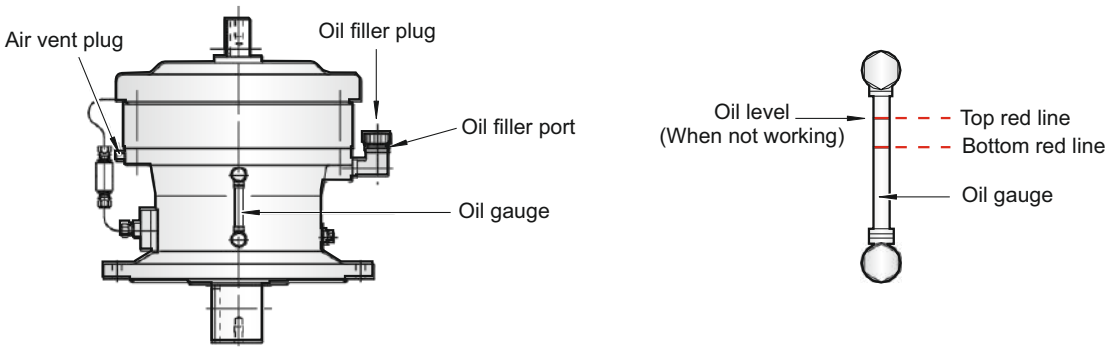
Figure 15: Horizontal Types



6.6.2 Oil Fill Procedure for Vertical Type

1. Remove the filling plug, remove the ventilation plug to empty the air.
2. Pour oil into the oil filler port, keeping an eye on the oil gauge to check the oil level.
3. Confirm that the oil level is up to the top red line on the oil gauge.
4. Wrap the ventilation plug with sealing tape and install it.
5. Replace the filler plug.

Figure 16: Vertical Types



NOTE !

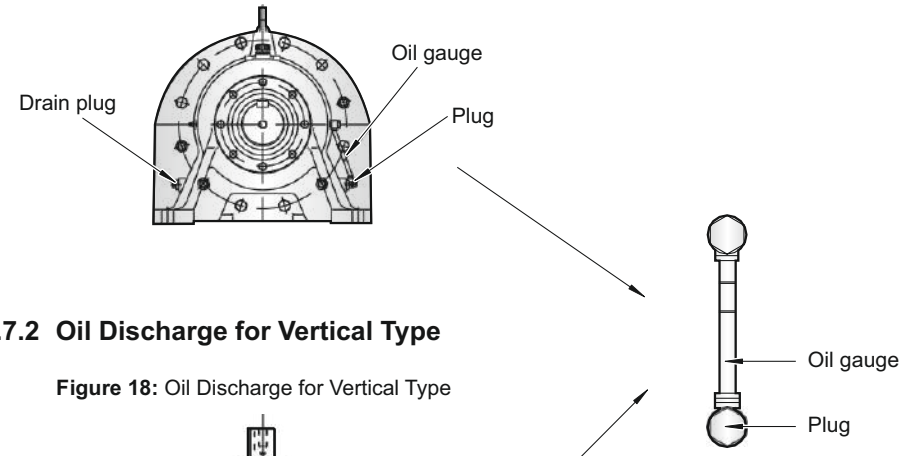
- Only fill oil when the machine is stopped.
- It will take some time for high-viscosity oil to reach a uniform level. Be careful not to fill with too much oil. (If oil is filled above the top red line, churning heat may raise the temperature.)
- Use the lower red line of the oil gauge as a guideline for the oil level while the machine is running. (The oil level may drop below the bottom red line immediately after the machine starts. It will return when oil viscosity drops as the machine runs. Therefore, this is not a problem.)
- For daily oil level management see Table 11 on (Page 46).

6.7 Draining Procedures

To drain the oil, remove the oil drain plug and the the plug at the bottom of the oil gauge.

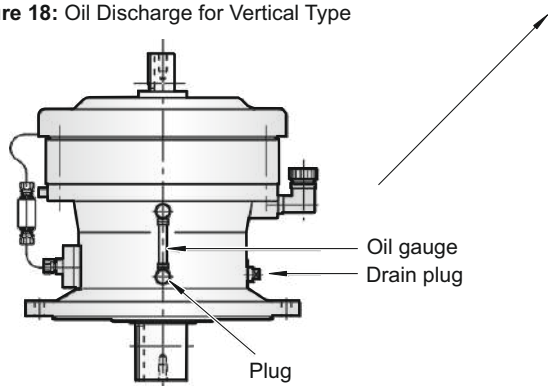
6.7.1 Oil Discharge for Horizontal Type

Figure 17: Oil Discharge for Horizontal Type



6.7.2 Oil Discharge for Vertical Type

Figure 18: Oil Discharge for Vertical Type



6.8 Long Term Inactivity

Table 20: Long Term Inactivity

Period of Inactivity	Approximately 1 month	Drain the old oil and make a new oil supply before putting the system on standby for about 1 month. After the new oil supply, run the system for a short time to ensure the homogeneous distribution of the oil to the gearbox.
	1 month or more	Before putting the system on standby for 1 month or longer, clean the gearbox, make an anti-rust oil supply, and then run it in an unloaded state for a few minutes

When resuming operation after a long period of inactivity, change to new oil because the existing oil may degrade.

6.9 Grease Supply for Grease Lubricated Gearboxes

Table 21: Grease Replenishment Intervals

Type	Grease Replenishment and Change Intervals
Maintenance - free grease - lubricated models (607...612)	Although these models use long-life grease, and can run for a long time without replenishment, maintenance with disassembly after approximately 20,000 hours or 3 to 5 years will further increase lifetime.
Other models other than maintenance-free grease - lubricated models (613...627)	Replenish as shown in Table 22. Maintenance with disassembly after approximately 20,000 hours or 3 to 5 years will further increase lifetime.

Table 22: Grease Replenishment Intervals (Except Long-Life Grease Lubricated Models)

Operation Time	Replenishment Interval	Remarks
Less than 10 hours per day	Once every 3 - 6 months	Shorten the replenishment interval when the operating conditions are severe or the frame size is large.
10 - 24 hours per day	Once every 500 - 1,000 hours	

6.10 Grease Filling and Unloading Procedure

Grease filling procedure for grease-lubricated models (Other models other than maintenance-free grease-lubricated models):

1. Remove the grease drain plug from the housing.
2. Make a grease supplement using a grease gun from greasing using the amounts of grease shown in Chart 18-1/18-2. If the greaser has a metal cover, remove the cover before adding oil. After filling, replace the metal cover.
3. Replace the grease discharge plug.

Figure 19: Location of Grease Fill and Discharge Port (Horizontal, Gearmotor, 2-Stage)

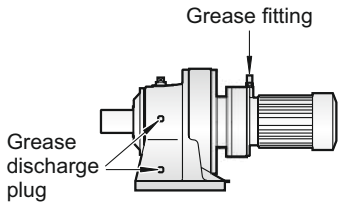


Figure 20: Location of Grease Fill and Discharge Port (Vertical, Gearmotor, 2-Stage)

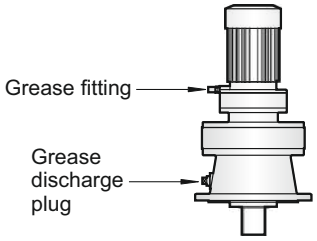
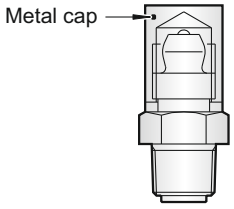


Figure 21: Grease Fitting with Metal Cap



NOTE !

- Grease while the machine is running to improve grease distribution.
- In addition to being used for discharging grease, the grease discharge plug also functions as a pressure vent when replenishing grease. Make certain to remove when replenishing.
- Replenish grease slowly.
- Replenishing more than the quantity shown in Table 18-1/18-2 may cause agitation heat, which raises the temperature, and may cause grease to leak into the motor unit.
- Grease may ooze out of the grease fitting after starting the machine. In such a case replace the grease fitting with one that has a metal cap.
- Be careful when handling the metal cap for the grease fitting as dropping it from a high place is dangerous.
- Contact the nearest authorized service station concerning changing all of the grease in a grease lubricated model.

7.1 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: At the disposal of waste oil, please obey both to the environmental protection laws as well as rules and regulations those are in force into countries which the machine has been using of.

7.1.1 Disposal

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

Table 23: Disposal Table

GEAR UNIT COMPONENTS	MATERIAL
Cycloid gears, shafts, bearings, adjustment springs, rings, bushings,	Steel
Gear unit housing,	Grey cast iron
Light alloy gear unit housing, light alloy gear unit housing components,...	Aluminium
Shaft seals, lock heads, rubber elements,	Elastomers with steel
Coupling components	Plastic with steel
Flat seals	Asbestos - free sealing material
Gear oil	Additive mineral oil
	Polyglycol-based Synthetic gearbox oil (label: CLP PG)

NOTE !

Please do not diffuse any biologically indivisible materials, oil and noninclusive components (PVC,rubber,resins and etc.) to the environment.

ATTENTION !

Do not reuse damaged parts during inspection, only should be changed by expert personnels.

7.2 Troubleshooting

Table 24: Troubleshooting

PROBLEM			CAUSE	SOLUTION
The motor does not work when it is not under load.			Power failure.	Contact the electrical company.
			Defective electrical circuit.	Check the circuit.
			The burned-out fuse.	Change the fuse.
			Activation of the protection device.	Fix the problem and save it.
			Load locking.	Check the load and the protection device.
			Bad ignition switch contact.	Set up the contact unit.
			Disconnecting the motor stator coil.	Contact the authorized service.
			Damaged bearing.	Contact the authorized service.
			Operation of 3 phases as a single phase.	Check the power supply with a voltmeter. Controlling the motor, transformer coil, condenser, fuse, etc. disassemble the parts, repair them or replace them with a new one.
			The friction surface of the brake is worn.	Please request brake cleaning from the authorized service.
			Incorrect brake clearance setting.	Adjust the brake clearance again.
The motor rotates when it is not on load, but the output shaft does not rotate.			Damage to the gear unit due to overload.	Contact the authorized service.
The output shaft rotates when it is not loaded.	When the load is applied.	**The ignition switch is overheating.**	Insufficient key capacity.	Replace it with the specified ignition key.
			Overload.	Reduce the load to the specified value.
		Fuse blows.	Insufficient fuse capacity.	Replace with the specified fuse.
			Overload.	Reduce the load to the specified value.
		The speed does not increase and the motor overheats.	Voltage drop.	Contact the electrical company.
			Overload.	Reduce the load to the specified value.
			A short circuit in the motor stator coil.	Contact the authorized service.
		The motor stops.	The key is not installed.	Insert the key.
			Damaged bearing.	Contact the authorized service.
			Poor adjustment of the protection device.	Set up the protection device.
	The motor is running in the opposite direction.		Connection error.	Change the connection.
	Blown fuse.		A short circuit in the output cable.	Contact the authorized service.
			Poor contact between motor and switch.	Make the connection well.
Extreme temperature rise.			Overload.	Reduce the load to the specified value.
			Voltage drop or rise.	Contact the electrical company.
			The ambient temperature is high.	Improve the ventilation method.
			Damaged bearing.	Contact the authorized service.
			Abnormal wear of gearbox parts due to overload.	Contact the authorized service.

PROBLEM		CAUSE	SOLUTION
Oil leakage	**Oil droplets or seal stains on the seal areas of the input or output shaft.**	The grease applied towards the oil seal leaks out of the seal first.	Wipe around the oil seal and observe.
	Oil or grease leakage in the sealed areas of the inlet or outlet shaft.	Damaged oil seal or damaged shaft or insert.	Contact the authorized service.
	Cycloid disk body, output body, etc.oil or grease leakage on the contact surfaces of the parts.	Loose connection bolts.	Tighten the connection bolts correctly.
	Oil or grease leakage into the motor.	Damaged oil seal.	Contact the authorized service.
		Excessive oil supply.	Drain off excess oil.
Abnormal sound / Excessive vibration.		Dust and foreign substances in the bearings or damaged bearings.	Contact the authorized service.
		Damaged gearbox parts.	Contact the authorized service.
		Bending of the body due to the inability of the installation platform to be straight.	Flatten the installation platform or adjust the installation using parts such as washers, etc.
		Resonance caused by insufficient rigidity of the installation base.	Strengthen the installation platform.
		The shaft is not on the same axis as the driven machine shaft.	Bring the shafts to the same axis.
		Vibration in the driven machine.	Run it separately to find out where the vibration is caused from.
Abnormal motor sounds.		Entry of foreign substance.	Contact the authorized service.
		Damaged bearing.	Contact the authorized service.
		Incorrect brake clearance setting.	Adjust the brake clearance again.
		Wear of the brake pad or disc.	Request a brake pad or disc from the authorized service.
		Burning of brake unit electromagnetic coil.	Contact the authorized service.
		The damaged diode.	Contact the authorized service.
		Failure of the leaf spring on the brake unit to remain closed or malfunction.	Contact the authorized service.
The brake is working ineffectively	**It's not being activated.**	The brake adjustment bolt is not set well.	Adjust the brake adjustment bolt again.
		Misalignment.	Ask the authorized service to make a re-adjustment.
	Braking is slipping / Braking takes a long time.	Failure to use the rapid braking circuit.	Switch to the fast braking circuit.
		Foreign substances on the brake pads or discs, oil stuck to the surface.	Contact the authorized service center for cleaning.
		Wear of the brake pad or disc.	Adjust the brake clearance. Contact the authorized service for the replacement of the brake pad and disc.
		The brake clearance is not equal on the entire surface.	Adjust the brake clearance.
		Overload.	Reduce the load to the specified value.
		The brake adjustment bolt is not set well.	Adjust the brake adjustment bolt again.

If there are problems or malfunctions different to the onesdescribed here contact a PGR Industries Assistance Centre.

8.1 Authorized Service

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

NOTE !

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 become invalid.

Table 25: Authorized Service

No	CRITERIA	MANUFACTURER (PGR)	AUTHORIZED SERVICE	CUSTOMER (USER)
1	Disassembly of geared unit	✓	✓	X
1.1	Case changing	✓	✓	X
1.2	Cycloid disc replacement	✓	✓	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-grease replacement	✓	✓	✓
5	Motor montage to C-FACE adapter type	✓	✓	✓
6	Motor montage to PAM type	✓	✓	✓
7	To the gearboxes with W connection; gear wheel, pulley, coupling, etc. installation of equipment	✓	✓	✓
8	Disassembly of motor from C-FACE / 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.

9.1 Declaration of Conformity

PGR® DRIVE TECHNOLOGIES

DECLARATION OF CONFORMITY

COMPANY
NAME : **POLAT GRUP REDÜKTÖR** SAN. VE TİC. A.Ş.
ADDRESS: Ata OSB Mah. Astim 1.Cad. No: 4, PK 105 Efeler / Aydın / TURKEY
PHONE : +90 256 231 19 12 (pbx)
FAX : +90 256 231 19 17

PRODUCT
NAME : **CYCLOIDAL GEAR UNITS**
TYPE : PCD
BRAND : PGR
MODEL :

H	607 ... 627	**H**	607 ... 07 / 627 ... 19
V	607 ... 627	**V**	607 ... 07 / 627 ... 19
F	607 ... 627	**F**	607 ... 07 / 627 ... 19

APPLIED REGULATIONS:

Machinery Directive	2006/42/AT
ATEX	2014/34/EU
Low Voltage Directive	2014/35/AB

APPLIED HARMONIZED STANDARDS:

TS EN ISO 12100:2010
TS EN ISO 13857
TS EN 60204
TS EN ISO 80079-36:2016
TS EN ISO 80079-37:2016

Our products comply with the regulations and standards described above. When our products are fitted with an electric motor, we fulfill the requirements to the extent that the Low Voltage Regulation is included in the application area 2014/35/EU.

CE

Applied Person
Neclet DEMİR
General Manager

Date: 11 July 2016

9.2 ATEX Document

1) **TEKNİK DOSYA ALINDI SERTİFİKASI**
CERTIFICATE OF RECEIPT OF TECHNICAL FILE

2) **ATEX 2014/34/AB Yönetmeliği'nin 15.1 b (2) maddesine göre teknik dokümantasyon tarafımızca alınıp, muhafaza edilmiştir.**
According to Article 13.1 b (ii), Directive 2014/34/EU, we confirm the receipt of documentation to retain it.

3) **Alındı Belgesi Numarası** / *Receipt Number*: **SCA18TDEX006/Rev.02**
Rev.01: Üretici markasının eklenmesi için sertifika revize edilmiştir / Revised to add the manufacturer's trademark.
Rev.02: Yeni model eklemek için sertifika revize edilmiştir / Revised to add the new model.

4) **Teknik Dosya Numarası** / *Technical File Number*: PGRATEX18/Rev.01

5) **Teknik Dosya Tarihi** / *Technical File Date*: 02.10.2024

6) **Ekipman veya Koruyucu Sistem** : **Redüktör Dişli ve Dişli Kutusu**
Equipment or Protective System : *Gearbox and Gear Unit*
Modeller / *Models*: P, PA, PF, PD, PM, PKD, PSH, PVA, PMRV, PMRV Plus, A, F, D, M, K, PL, PLB, PH, PB, PYK, PRC/PRCF, PEX, PCS, PCD

7) **Üretici** / *Manufacturer*: **Polat Grup Redüktör San. ve Tic. A.Ş.**

8) **Üretici Adresi** / *Address*: *Ata Mah. Astim Osb 1. Cadde , No:4 Efeler/Aydın-TÜRKİYE*

9) **30 Haziran 2016 tarihli 2014/34/AB Yönetmeliği gereğince 2336 numaralı onaylanmış kuruluş olan SCA, üretici firmadan teknik dokümanların (Teknik Dosya) alındığını bu yazıyla birlikte beyan eder.**
SCA, notified body that no. 2336, in accordance with the Council Directive 2014/34/EU of 26 February 2014, herewith acknowledges receipt, from the Manufacturer, of the technical documents (Technical File).

10) **Bu alındı bildirimi, ATEX 2014/34/AB Yönetmeliği'nin 15.1 b(2) maddesi gereğince teknik dokümantasyonu içeren dosyayı onaylanmış kuruluşa iletmekle ilgili üreticinin sorumluluğunun yerine getirildiğine ilişkin bir kanıt niteliğindedir. Bu ekipmanın veya koruyucu sistemin üretimine veya tedariğine ilişkin yönetmeliğin diğer hükümleri saklıdır.**
This acknowledgement is an evidence about fulfilment of manufacturer duties concerning communicate the dossier of technical documentation to notified body in accordance with clause Article 13.1 b (ii) of Directive 2014/34/EU ATEX. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system.

11) **SCA, en son üretilen üründen itibaren Teknik Dosya'yı en az on yıl saklar. Üreticinin Teknik Dosya'yı saklamayı sürdürmesi konusunda bir sorun oluştuğunda SCA Teknik Dosya'yı, bu alındı belgesinin onaylandığı tarihte başlayarak, arşivlerinde 10 yıl boyunca saklayacaktır.**
SCA holds the Technical File for at least ten years from the date of the last manufactured apparatus. In case of lack of a written acknowledgement from the manufacturer about the intention of maintaining the Technical File deposit, SCA will hold the TECHNICAL FILE in its archives for 10 years, starting from the date this receipt is confirmed.

12) **Bu alındı belgesi sadece bütünüyle ve değişiklik yapılmadan çoğaltılabilir.**
This receipt can be reproduced only entirely and with no change.

13) **Üretici Tarafından Beyan Edilen Referans Standartlar**/*Reference standards according to manufacturer's declaration*:
EN ISO 80079-36:2016 , EN ISO 80079-37:2016

14) **Üreticinin beyanına göre ekipman veya koruyucu sistemin etiket tanımı:**
Marking of the equipment or protective system according to manufacturer's declaration:

Ex **II 2G Ex h IIC T4 Gb**
II 2D Ex h IIIC T120°C Db

Digitally Signed

Onay Tarihi: **25.11.2024**
Issue Date

ONAY / *CONFIRMATION*
Emre KOCUKLU
Teknik Düzenleme Sorumlusu
Technical Manager

SCA Belgelendirme ve Özel Eğitim Hizmetleri Ltd. Şti.
Küçükçiğli Mah. 8785/1 Sokak No:17 Çiğli -İZMİR / TÜRKİYE
Phone: 0090 (232) 489 02 12 Fax: 0090 (232) 489 02 17
www.scaatex.com e-mail: info@scaatex.com

FR.47/08.11.2024/02 01/01

10.1 Contact Information

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ASSEMBLY FACTORY AND LOGISTICS CENTER

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