

# CM45 – CM70 – CM100

## Transit Mixer Gearboxes

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### User Manual

version 1.3



## Contents:

1. Overview.....	Page 3
2. Features.....	3
3. Sizes and Ratios.....	4
4. Dimensional drawings.....	5 - 6 - 7
5. Hydraulic motors.....	8
6. Mounting.....	8
7. Installation.....	8
8. Oil Lubrication.....	9
9. Standard Maintenance.....	10
10. Troubleshooting.....	11
11. References.....	11
12. Warranty Paper.....	12

## 1. Overview

Dear Customer,

Thank you very much for the purchasing of CM series gearbox!

The CM Series is the solution for transit mixers. Boasting an extremely well tested on-field operating life, these gearboxes are available in three different sizes to perfect fit every needs from small to medium small transit mixers. The off-axis tilting system allow a better support for the radial load, self compensating the different angles. The load on bearings doesn't change. The rotating body combined with overhanging gears allow a very compact design, which can easily fit in the narrow space on transit mixers. The ring gears are oversized, assuring extremely high reliability, torque peaks resistance and virtually eternal lifespan. The rugged, sturdy construction ensure minimal maintenance, with just normal oil substitutions required.

The planetary gearbox concept allow a high reduction ratio in a compact and robust design, ensuring the highest efficiency in terms of friction reduction and energy loss.

The planetary gearboxes have proven to be much advantageous when compared with more traditional gears chain gearboxes in terms of performances, weight and size. The torque is internally distributed to all the gears without weak or critical points.

The experience of several decades can assure the absolute reliability of this solution.

## 2. Features

### - Rotating body

The concept behind CM series is to have the gearbox body as part of the gears themselves. The whole body rotate solid with the drum, with all the gears placed inside leaving just the tilting support outside. The main advantage is the size reduction to the minimum possible, with an overall length much shorter than the traditional solution with just rotating flange. The overhanging gears requires a protecting carter inside the drum, but the customer can have a shorter length of the assembly maintaining the same capacity or have more capacity in the same size.

### - Off-axis tilting support

Other manufacturers offer a simple fork tilting support. CM series instead offer a special off-axis tilting support. This solution can give a much better overall balancing of the weights. The off-axis distance between the tilting axis and the rotating axis is carefully calculated to obtain the best balance on the main bearings at the standard tilting angle.

The bending due to the weight of the full drum is reduced and much better supported by the gearbox.

- Oversized gears

All the gears of CM series are oversized after theoretical calculations. This makes every kind of breakage virtually impossible, avoiding costs of substitution, time required, disassembly, and ensuring the best satisfaction to the final user.

PGI take no compromise regarding the material used to manufacture the gears: always and only the best available military grade steel alloys

- Flexibility

All CM series gearbox can be fitted with different kinds and brands of hydraulic motors. Just small adaptation are required to the flange to accommodate different sizes.

PGI will be happy to offer the proper flange to mount your preferred motor.

The tilting flanges are available with different diameter fastening holes.

For special applications the back mounting non-tilting flanges are available for all the models.

- Single piece fixed part

The fixed, non-rotating parts of the CM gearboxes are now built in one single piece. This solution, while more complex than a two-parts bolted assembly, ensure the best load support, as well as no issues at all in case of heavy vibrations, which could, in extreme scenarios, lead to a self-disassembling of the gearbox. Also important, all the old design CM gearboxes can be retrofitted with this solution at a fraction of the cost of a complete new one.

- Fully sealed gearboxes

The CM series gearboxes are designed with a full sealing solution, keeping the whole assembly as a separate entity from the hydraulic motor. It is possible to disassembly and substitute the hydraulic motor without the need to empty the gearbox oil before

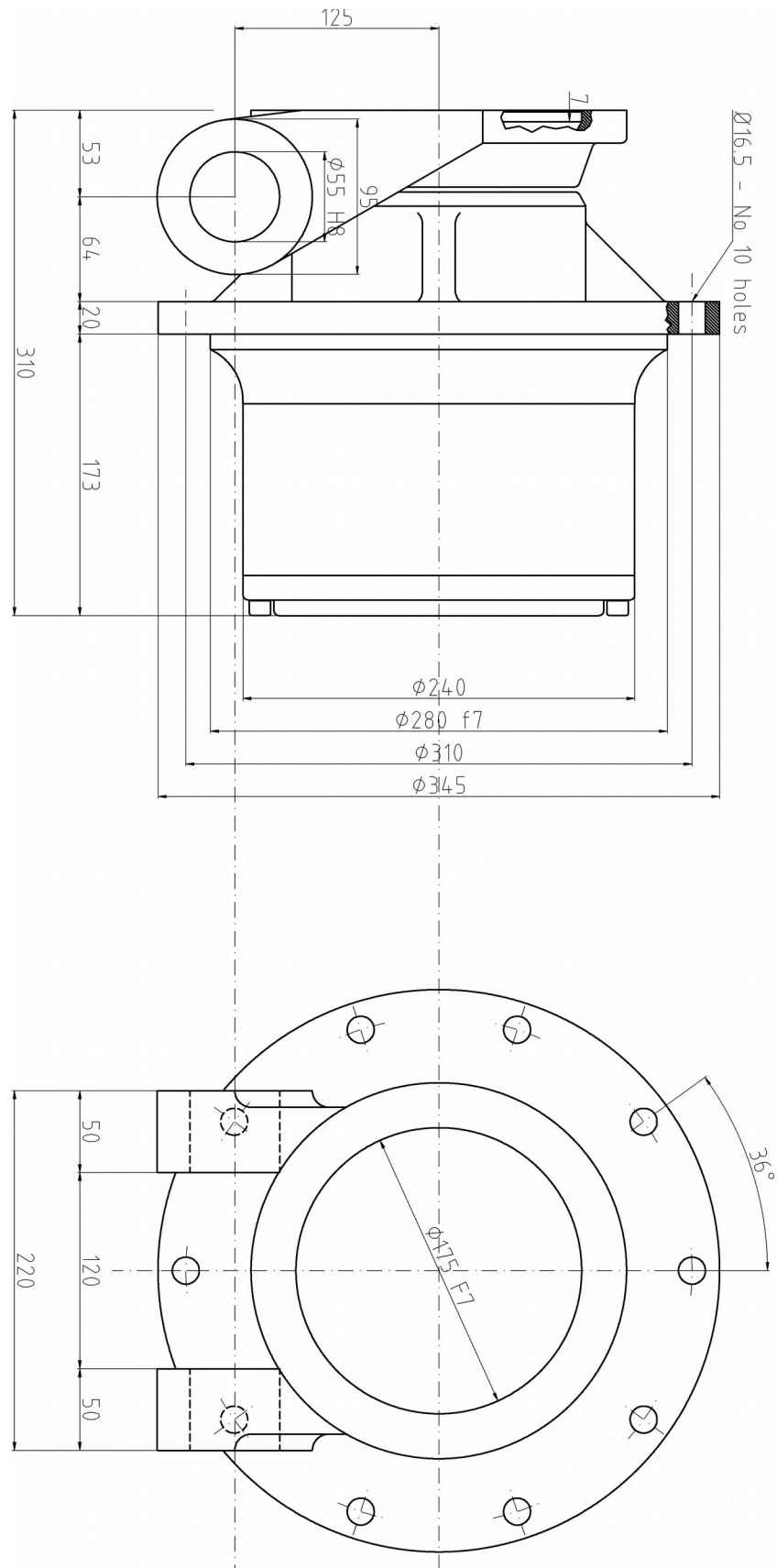
### 3. Sizes and Ratios

CM series is available in the following versions:

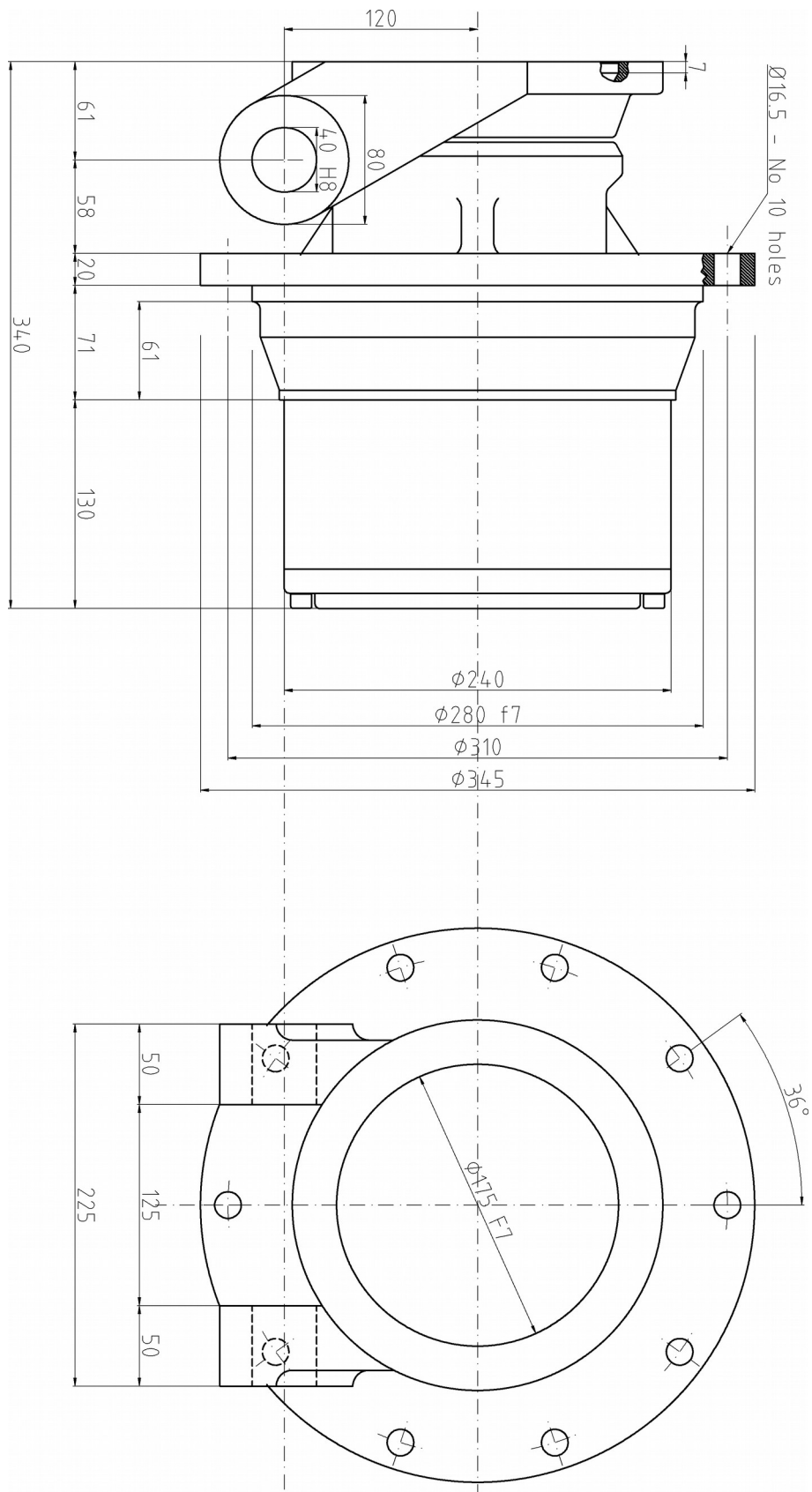
Model	CM45	CM70	CM100
<i>Ratio:</i>	1:15 - 1:16,5 – 1:22	1:15 - 1:16,5 - 1:22	1:22 – 1:24 – 1:33
<i>Max Cont. Torque:</i>	850 daNm – 6200 Lbs/Ft	950 daNm - 6930 Lbs/Ft	1300 daNm - 9500 Lbs/Ft
<i>Max Peak Torque:</i>	1300 daNm – 9500 Lbs/Ft	1500 daNm – 10940 Lbs/Ft	2050 daNm - 14900 Lbs/Ft
<i>Max Radial Load:</i>	4500 daN - 9900 Lbs	7000 daNm – 15400 Lbs/Ft	10000 daNm – 22000 Lbs
<i>Dry Weight:</i>	102 Kg - 224 Lbs	104 Kg - 228 Lbs	158 Kg - 347 Lbs
<i>Oil Quantity</i>	2,5 Litres - 0,45 Gal	2,5 Litres - 0,45 Gal	3 Litres - 0,8 Gal

#### 4. Dimensional drawings

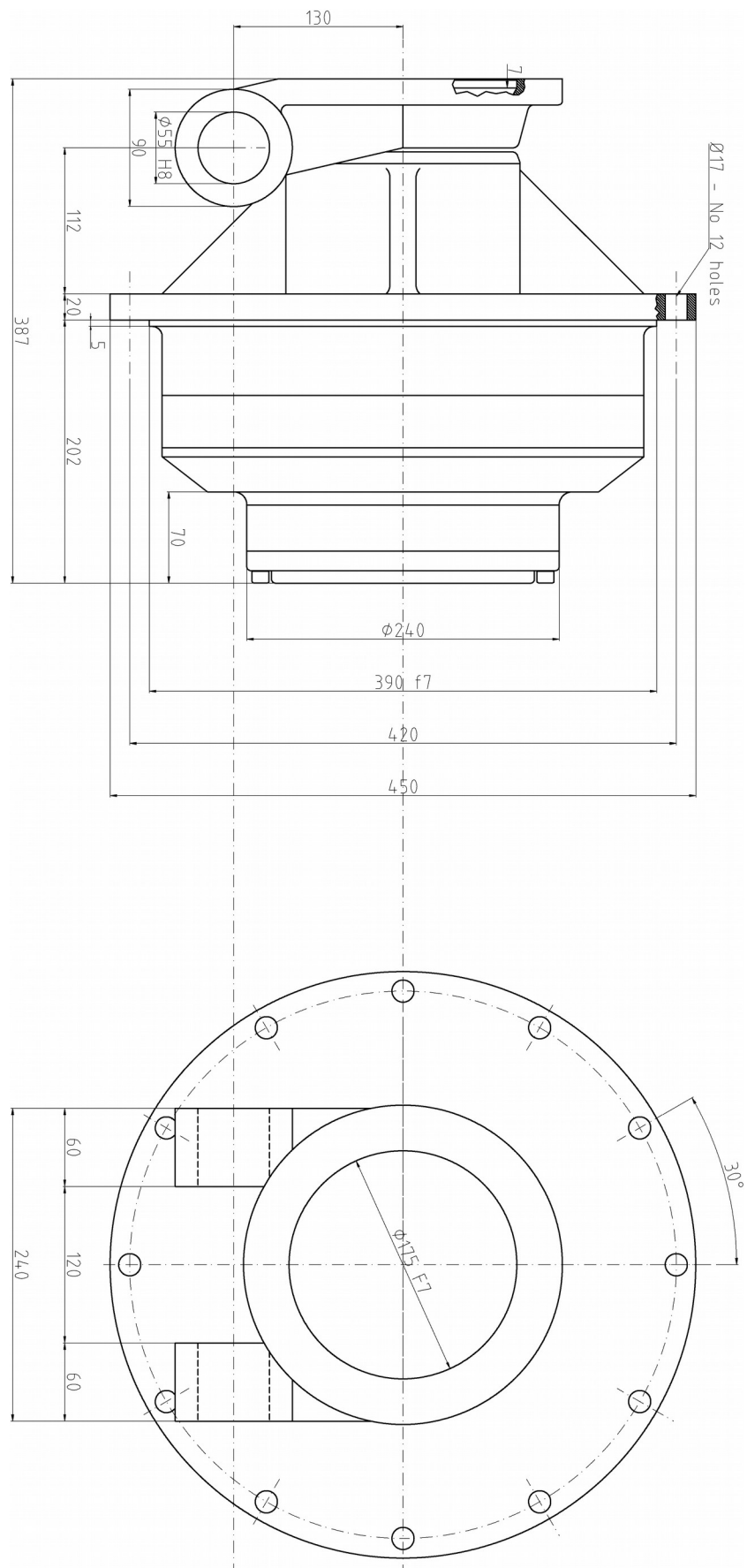
# CM 45 - 1:15 - 1:16.5 - 1:22



# CM 70 – 1:15 - 1:16,5 - 1:22



# CM 100 – 1:22 – 1:24 – 1:33



## 5. Hydraulic Motors

The CM series gearboxes can be fitted with several different kind of hydraulic motors, including piston motors and orbital motors.

In case of use with powerful motors, it could be necessary to take special cares to avoid damages to the gearbox. PGI will be glad to offer help in choosing the right motor.

Use with radial piston motors:

Radial piston motors, unlike orbital motors, feature a very high torque at low speeds, and this could harm the gears if improperly used.

- Avoid instant rotation inversion of the rotation direction, leaving the drum to fully stop before change direction of rotation. Do not “shake” the drum to help the separation of concrete.
- We also recommend to avoid rush of power from truck engine.

PGI is glad to offer to its customers a complete solution perfectly fitting of gearbox, motor and coupling flange. Please refer to PGI Technical Service for all the requirements. (see chapter 11)

## 6. Mounting

The CM gearboxes are offered with the unique off-axis tilting support, optimized to balance at best the load on the gearbox. The holes have standard diameter of 55 mm, but different diameters are available on customer's requirement.

Also, fixed supports are available on request for static applications (stationary mixers, winches, drills, wheel drives, capstan drive, etc.)

## 7. Installation

Every unit is supplied with this reference manual. Keep it in safe place for future consulting.

The gearboxes are provided with a protective oil coating which guarantee full protection against rust, moisture and dirt. In case of storing before use, please ensure to check regularly the condition of the coating and replenish if needed.

**Important:** in case you want to paint the gearbox, please make sure to avoid to paint the rubber sealing, as the solvent contained in the paint can chemically react with the rubber and destroy it in very short time.



## 8. Oil Lubrication

Lubrication is a fundamental part of the performance and life of the gearbox. Please take time to read carefully this chapter and following.

To avoid spilling and environmental issues, all the gearboxes are provided **not pre-filled with oil**, so please fill up with proper oil before commissioning.

The gearbox are manufactured with two oil plugs, to make easy the fill and substitution of oil. **Do not exceed the required quantity**: this could lead to a high pressure inside the gearbox and damage the rubber seals.

We recommend the following oils:

Brand	Ambient temperature 30 to 65 °C	Ambient temperature 40 to 75 °C
Indian Oil	Servomesh 220	Servomesh 320
Hindustan Petroleum	Gervil EP 220	Gervil EP 320
Bharat Petroleum	Energol GRHP 220	Energol GRHP 320
Esso	Spartan EP 220	Spartan EP 320
Castrol	Alpha EP 220	EP Alpha 320
Shell	Omala EP 220	Omala EP 320

In case you prefer to use another brand not named in this table, please call PGI Technical Service to get approval

Required quantity:

<b>CM45</b>	<b>CM70</b>	<b>CM100</b>
<b>2,5 Lt. / 0,65 Gal</b>	<b>2,5 Lt. / 0,65 Gal</b>	<b>3 Lt. / 0,8 Gal</b>

### **DO NOT EXCEED THE REPORTED QUANTITY**

To ensure the maximum reliability it is fundamental to use the proper oil matching environmental working condition. Excessive working temperature (long time heavy load, harsh environments) can short the life of the oil, so periodical checks are mandatory to avoid failures.

## 9. Standard Maintenance

The CM series gearboxes are developed and manufactured taking the best care to give to customers not only the best quality but also the shortest and easiest maintenance time. Only few cares are required:

- **Oil must be changed every 10000 working hours.** This time is strongly dependant from working condition, and it is calculated for a standard use in normal environment. Some special working conditions requires a shorter substitution time:

- Constant heavy load
- Harsh environment (heavy dust, atmospheric exposure)
- High or very low temperature

Please check regularly the oil level and refill if needed. Do not mix different type of oils. Do not exceed the required quantity.

Please also note that a short time of running in is required after first commission.

**The first oil change is recommended after 500 working hours.**

- Periodically check that all the external bolts are properly tightened. High vibrations level can make the bolts to unloose themselves.

Do not operate on internal bolts, as they are designed to be totally maintenance-free. As these bolts are capitals for the perfect functioning, they are assembled in our facility with a calculated pre-charged torque and should not be disassembled for any reason. In case of need, please call the PGI Technical Service (see chapter 11)

No other maintenance cares are required.

Please note that any activity performed on the gearbox other than standard maintenance must be performed only by PGI personnel.

For further details, please refer to the Warranty Paper or call PGI Technical Service to clear every doubt (see chapter 11)

## 10. Troubleshooting

Oil leakages:

- Check for proper tightness of the two plugs
- Check if breather plug is properly functioning.
- Check for proper oil quantity inside the gearbox.
- Check visually for rubber sealing are properly placed and in good conditions
- If the problem is not solved please contact PGI Technical Service (see chapter 11)

Loosen bolts:

- Tight them with the proper key
- Try to avoid or reduce vibrations
- If the problem happens regularly, please contact PGI Technical Service (see chapter 11)

Misalignments:

- Stop immediately the machine and contact PGI Technical Service (see chapter 11)

## 11. References

For each technical question regarding the CM series gearboxes, please contact the following address:

### PGI Technical Service

B53 ITI Ancillary Industrial Estate White Field Road  
Bangalore 560049 Karnataka India

phone: 0091-80-30772435

fax: 0091-80-41525144

[info@pgidrives.com](mailto:info@pgidrives.com)

## 12. WARRANTY PAPER

PGI is glad to offer to its customers the best service to ensure a trouble-free life of their products. The following table resume the warranty terms.

### Warranty coverage

- Materials
- Assembly and Workmanship
- Original parts and components
- Motor flange and its assembly **if provided by PGI** (please note that the motor has its own User Manual and Warranty Paper; refer to them for details)
- Spare parts if provided by PGI

### Warranty does not cover:

- Lubricating oil
- Non-original spare parts
- Overtime operational efficiency reduction
- All commercial components after their standard working life
- All external assembly bolts and flanges not pre-assembled by PGI
- PGI gearboxes purchased from other suppliers (please refer to your supplier for warranty terms)
- Motor and flange **if not provided by PGI**, as well as its assembly

### Warranty will void in case of:

- Warranty Seals are broken or damaged
- Use of the gearbox beyond its technical specifications (see cap. no 3)
- Any kind of maintenance operation other than what reported in the User Manual or authorized by PGI
- Lack of standard maintenance (see cap. no 9)
- Use of improper lubricating oil (see cap. no 8)

**Note: some warranty seals are placed on the gearbox during the assembly in the PGI workshop to avoid tampering.**