



**PGR<sup>®</sup>**  
DRIVE TECHNOLOGIES

P - Pt/A

**S E R I E S**

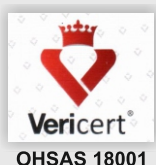
MAINTENANCE AND OPERATION INSTRUCTIONS

**ATEX**

Shaft Mounted Speed Reducer, (P - Pt/A)  
GEARBOXES WITHOUT MOTORS

Doc. No : P - Pt/A

MOI : 12 / 18



Certificate Number: KY3723/05/10-R





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## 1.1 Important Warnings

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



### **EXPLOSION !**

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



### **ATTENTION !**

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



### **NOTE !**

Advices and necessary informations for the user



### **DANGER !**

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



### **DANGER OF ELECTRICITY !**

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



### **DANGER !**

**Danger possible result**  
Death and heavy woundings



### 1.2 General Information

This user guide is prepared by our firm to provide information about safety of gearboxes as well as storage, installation/mounting, connection, operating, maintenance and repair processes. All the purchase and technical data are positioned at product catalogues. Beside engineering applications, the informations which placed in this instruction, should be well read and applied. The documents must be protected and to get ready for controlling by authorized person.

### 1.3 Correct Use

	<b>EXPLOSION !</b> 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.
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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.

	<b>DANGER !</b> <b>Danger to persons.</b> 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.
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### 1.4 Safety Information

	<b>EXPLOSION !</b> 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.
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In gearboxes, there could be materials subjected to voltage, movable pieces and hot areas. During all the works to be done; transportation, storage, placing, mounting, connection, operating, maintenance-repair processes could be implemented by qualified employees and responsible managers.

**All the processes to be implemented during the working period;**

- Related usage and maintenance instructions,
- Warning and safety tags in gearboxes,
- Instructions and Requirements related to the system,
- Local and International requirements for safety and accidental 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 gearboxes,
- Improper use (Any use outside the limits specified in the User's Manual and outside the name label/catalog values; especially at high moment and at different speeds) and incorrect installation or use of the gearbox in operation,
- Extremely dirty and maintenance free of gearboxes,
- Unlubricated usage,
- Take out of the necessary protective plugs,
- Disuse of original pieces in gearboxes,
- 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, declines any responsibility in case of:

- Use of the reducer not compliant with national laws on safety and accident prevention,
- Work done by unqualified personnel,
- Incorrect installation,
- Tampering with the product,
- Incorrect or failure to follow the instructions in the manual,
- Incorrect or failure to follow the indications marked on the identification labels fixed on the units,
- Incorrect connections and/or use of temperature sensors (when present),
- Use of gearbox under unlubricated conditions.

The products supplied by PGR are intended to be incorporated into "complete machines", so it is prohibited to put them into service until the entire machine has not been declared compliant.



### **ATTENTION !**

The configurations provided in the catalogue of the unit are the only ones allowed. Do not use the product in contrast with the indications provided in it. The instructions provided in this manual do not replace but compensate the obligations of current laws concerning safety regulations.

## **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 eyebolts must be tightened. These eyebolts sized to carry the weight of only gearboxes. The additional weight should not be added. The flanged eyebolts must be suitable to the DIN 580 norm.
- If the gearbox has two lifting eyes, both can be used depending on the size of the gearbox during transport. A suitable and sufficiently large sized carrier must be used, when required.
- Carrying safeties should be removed before the start of operating.
- The weights of the movable gearboxes 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 !

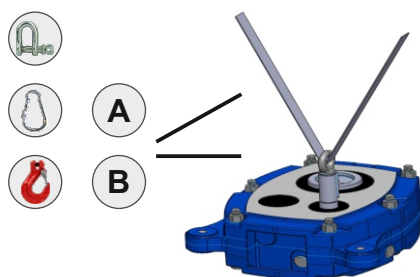
During the carrying process, the fixings like the lifting lug, hook, belt, rope, locked hook must be sufficient to the load and have conformity certificate. The weights of the movable gear unit/gear unit with motor have given in product catalogue.



### NOTE !

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

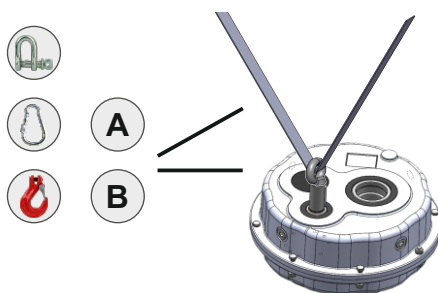
## P SERIES



- |          |                       |  |            |  |                  |
|----------|-----------------------|--|------------|--|------------------|
| <b>A</b> | Hoop equipped (swab)  |  | Load hook  |  | Locked hook      |
| <b>B</b> | Hoop equipped (chain) |  | Screw hook |  | Lifting eyebolts |

Manuel lifting (Weight  $\leq 15$  kg)(ref. ILO Contract)  
Not: valid for the continuous carrying.

## Pt/A SERIES



- |          |                       |  |            |  |                  |
|----------|-----------------------|--|------------|--|------------------|
| <b>A</b> | Hoop equipped (swab)  |  | Load hook  |  | Locked hook      |
| <b>B</b> | Hoop equipped (chain) |  | Screw hook |  | Lifting eyebolts |

Manuel lifting (Weight  $\leq 15$  kg)(ref. ILO Contract)  
Not: valid for the continuous carrying.

## 1.7 Storage

The certain suggestions have given about storage conditions of the gearboxes below.

- In clear and moist-airs, the storage should not be made.
- The gearboxes should not be directly contacted to the ground.
- The place must be moveless where the gearboxes 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.
- Gearboxes must be in place where there will be no big temperature differences between -5 and 40.
- Relative humidity must be less than %60.
- Not directly be exposed to sunlight and 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;

	<p><b>NOTE !</b></p> <ul style="list-style-type: none"> <li>- In the long-term storage or during the short-term storage, if the excessive temperature differences occur, the oil in the gear unit must be changed before the operating.</li> <li>- In the fully oil filled gear unit, the oil level should be reduced according to the mounting position.</li> </ul>
	<p><b>ATTENTION !</b></p> <ul style="list-style-type: none"> <li>- The incorrect and excessive long storage could cause the gearbox getting defected.</li> <li>- Please control not to exceed allowed storage period before starting up the gearbox.</li> </ul>
	<p><b>NOTE !</b></p> <ul style="list-style-type: none"> <li>- PGR, recommends long-term storage option for periods of more than 9 months holding and pausing times.</li> <li>- 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.</li> </ul>

### Long Term Storage Suggestions;

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



## 2. PRODUCT DESCRIPTION

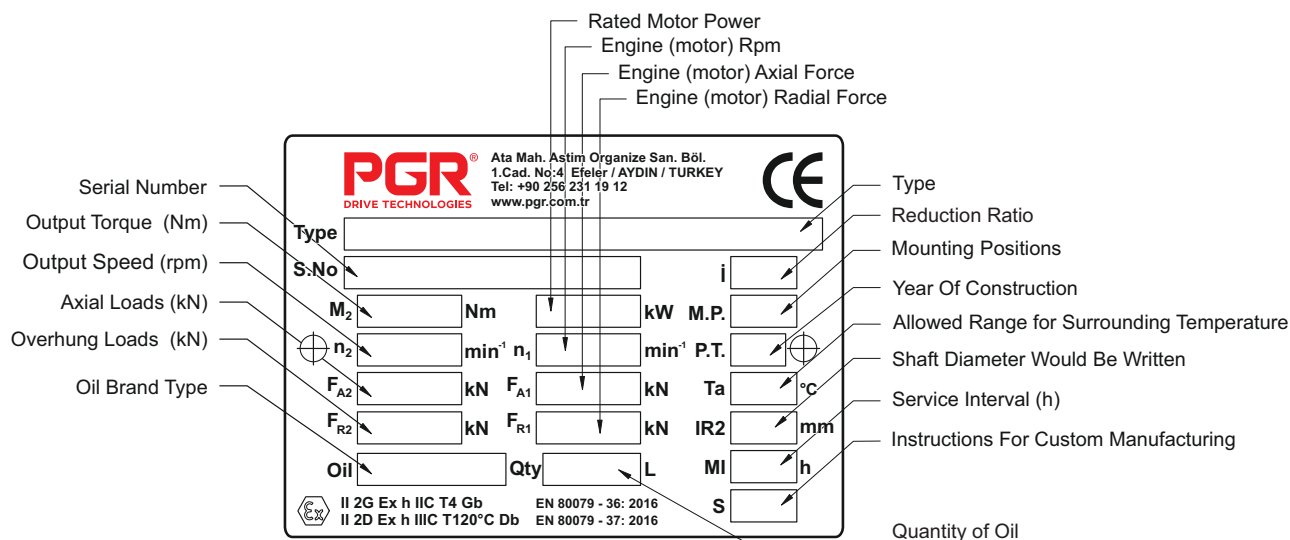
### 2.1 Gear Unit Label



#### 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.



#### Marking according to ATEX ( DIN EN 80079-36 ):

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**) 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 !

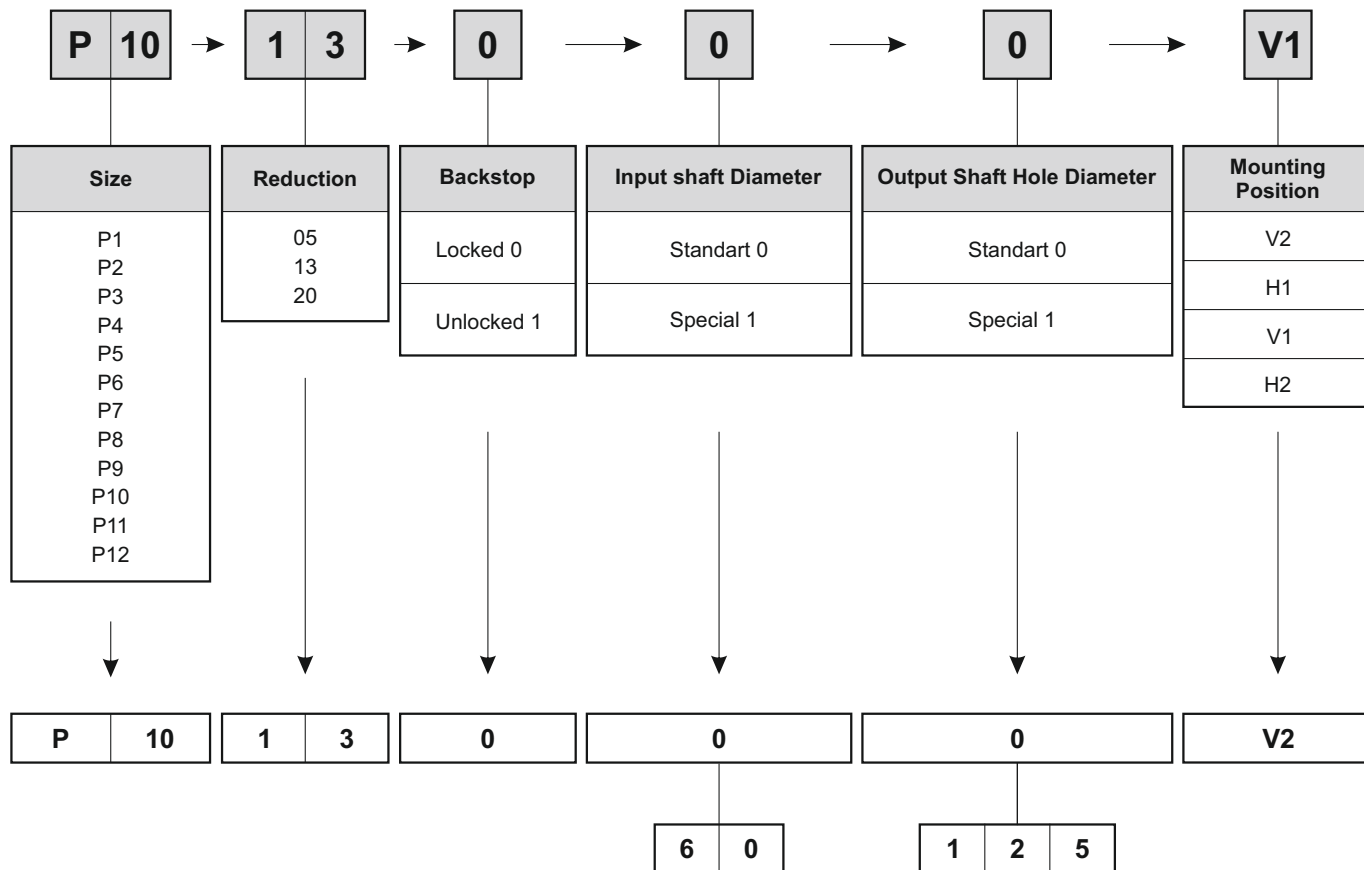
The nameplate specifications regarding the maximum surface temperature, refer to readings taken in normal ambient and installation conditions. Even minimal variations to said conditions (e.g. smaller mounting cabinet) may have a significant effect on the unit's heat output.





### 2.3 Explanations

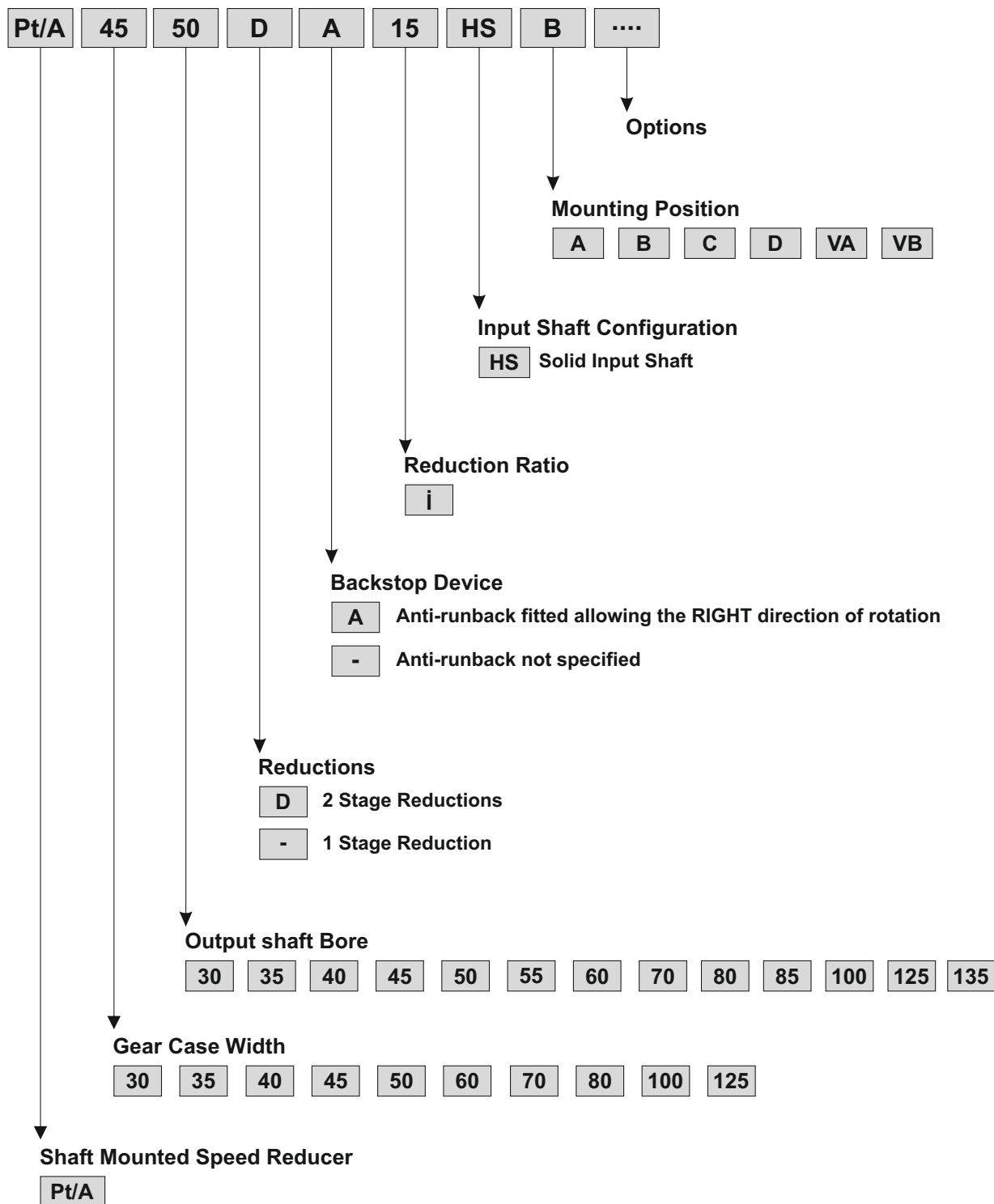
#### P SERIES (Shaft Mounted Speed Reducer)





## 2. PRODUCT DESCRIPTION

### Pt/A SERIES (Shaft Mounted Speed Reducer)





### 3.1 Prerequisites Of Assembly

	<b>EXPLOSION !</b>
	<p><b>Explosion hazard:</b> 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.</p>

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.

	<b>NOTE !</b>
	<p>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.</p>

Motors that are going to be supplied should be ATEX adaptable. The motor labelling must also comply with data for the planning of the plant or the machine.

	<b>EXPLOSION !</b>
	<p><b>Explosion hazard:</b> Failure to comply may cause severe or even fatal injuries.</p>
	<ul style="list-style-type: none"> <li>• The gear unit may only be operated in the stated version.</li> <li>• 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 Maintenance" or the special documentation, shows the configuration of the individual types of gear units.</li> <li>• 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.</li> </ul>
	<p><b>Please heed the Operating Instructions for the motor, in particular with regard to the chosen version.</b></p>


### Prerequisites Of Assembly

Take into the consideration which listed below;


- There could be no damage in the gear unit.  
At standard gear units;
- The ambient temperature should be fitted temperature values given in the 'Lubricant' part.


	<b>EXPLOSION !</b>
	<p>The bearings, gear wheels, shafts and housing may be damaged by incorrect fitting.</p> <ul style="list-style-type: none"> <li>• Observe the assembly instructions.</li> <li>• 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.</li> </ul>



	<b>EXPLOSION !</b>
	<p><b>Before access to a plant, those belows should be controlled and be secured:</b></p> <ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li><li>• During operating process, the temperature of cooling air should not exceed 40C.</li><li>• Controlling of lubricant and both discharging plugs and valves must be easily accessible.</li><li>• Several other devices belong to gearbox, separately from their own functions should have an ATEX Certificate. (Protective electrical working substance against explosion)</li><li>• The setting of gearboxes which have hollow shafts (even if there may be a friction preventer connection or may not) should be made properly according to an instructions at this hand guide.</li><li>• After set up process is completed, cleaning of gearbox would be required.</li><li>• 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.</li></ul>

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.

	<b>DANGER !</b>
	<p>There is a danger of injury due to shrink discs and freely rotating shaft journals.</p> <ul style="list-style-type: none"><li>• Use a cover (Option KK) as a guard.</li><li>• 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.</li></ul>

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

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/hollow shaft, jerks etc. must be cleaned.

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

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

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




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

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

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



#### 3.2 Gear Unit Mounting

	<p><b>EXPLOSION !</b></p> <p><b>Explosion hazard:</b> Failure to comply may cause severe, or even fatal injuries.</p> <ul style="list-style-type: none"> <li>• No explosive atmosphere must be present when installing the gear unit.</li> <li>• The cooling air supplied to the gear unit/geared motor must be within the permissible temperature range stated on the type plate.</li> <li>• 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°C below the highest permissible temperature of the ambient temperature range <math>T_u</math>, which is stated on the type plate.</li> </ul>
	<p><b>DANGER !</b></p> <p><b>Danger of Burns:</b></p> <p>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.</p>
	<p><b>DANGER !</b></p> <p>Damage to the gear unit due to overheating.</p>

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.
- Please do not wrap circle of the gearbox or not to cover up completely.
- 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 gear unit is fitted should be vibration-free, torsionally rigid and flat (flatness error <0.2 mm).

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.

Welding of the gear unit is prohibited. The gear unit must not be used as the earth connection for welding work, as this may cause damage to the bearings and gear wheels.

The gear unit must be installed in the correct orientation (please see chapter 3.1 "Prerequisites Of Assembly") and (please see chapter 4.1 "Control And Maintenance").

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 3.2.1 "Bolt Tightening Torque Value"). Tension-free bolting must be ensured, particularly for gear units with a foot and flange. Oil checking and oil drain screws must be accessible.



### 3. ASSEMBLY INSTRUCTIONS, PREPARATION, INSTALLATION

#### 3.2.1 Bolt Tightening Torque Value

Bolt Tightening Moments [Nm]						
Dimensions	Bolt Quality			Cover Bolts	Coupling Bolts	Protective Cover Connection Bolts
	8.8	10.9	12.9			
M4	3.2	5	6	-	-	-
M5	6.4	9	11	-	2	-
M6	11	16	19	-	-	6.4
M8	27	39	46	11	10	11
M10	53	78	91	11	17	27
M12	92	135	155	27	40	53
M16	230	335	390	35	-	92
M20	460	660	770	-	-	230
M24	790	1150	1300	80	-	460
M30	1600	2250	2650	170	-	-
M36	2780	3910	4710	-	-	1600
M42	4470	6290	7540	-	-	-
M48	6140	8640	16610	-	-	-
M56	9840	13850	24130	-	-	-
G½	-	-	-	75	-	-
G¾	-	-	-	110	-	-
G1	-	-	-	190	-	-
G1¼	-	-	-	240	-	-
G1½	-	-	-	300	-	-

**Table 1** : Bolt tightening torque value



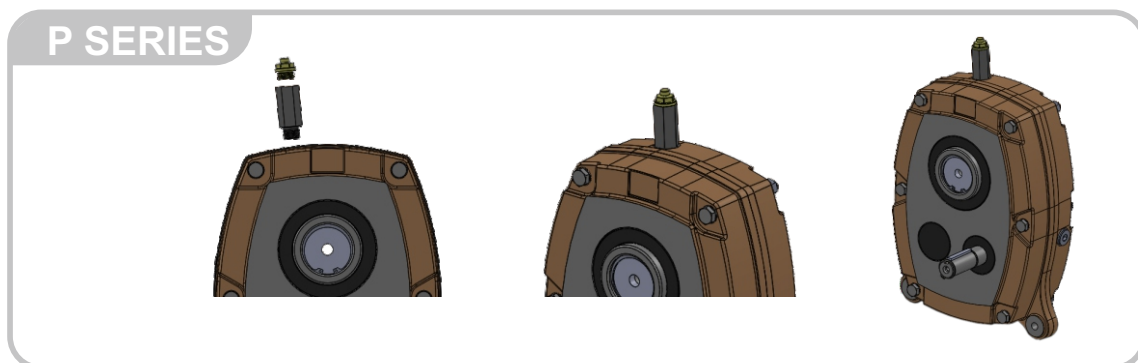
### 3.3 Gear Unit Ventilation

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.

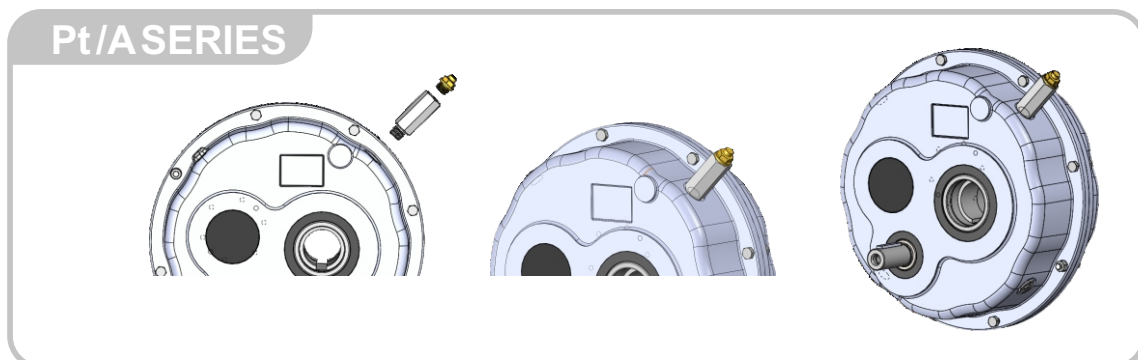
The pressure vent must be activated prior to commissioning. To activate, remove the transport securing devices.

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



**Figure 1:** Activation of the pressure vent



**Figure 2:** Activation of the pressure vent



#### 3.4 Temperature Sticker



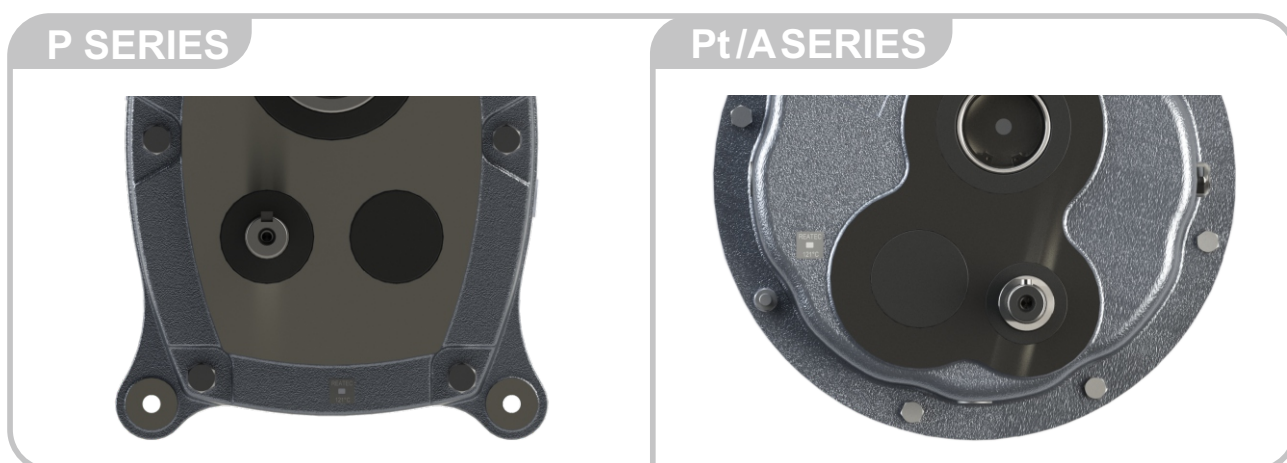
##### EXPLOSION !

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 4.7 "Temperature Measurement") 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.



Picture 1: Position of the temperature sticker

##### 3.4.1 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.





### 3.5 Checking the Coupling

(Only necessary for category 2G and IEC / NEMA standard motor attachments)

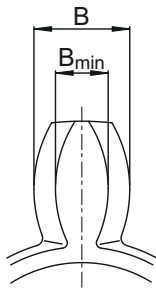
The motor must be removed. Plastic or elastomer coupling components must be examined for traces of wear. If the limiting values listed below for the particular coupling versions and sizes are exceeded, the plastic or elastomer coupling components must be replaced.



#### NOTE !

Only use replacement parts with the same colour.

With claw couplings (ROTEX®) the tooth thickness of the elastomer gear rim must be measured as shown in the illustration.  $B_{min}$  is the minimum permitted tooth thickness.

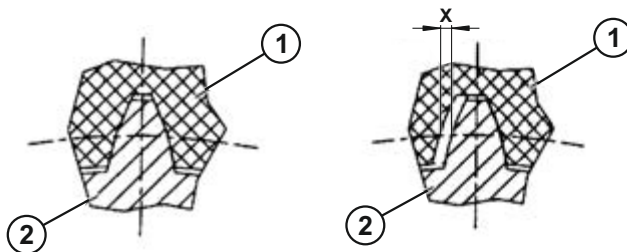


**Figure 3:** Measurement of gear rim wear on the ROTEX® claw coupling

Limiting Wear Values For Coupling Gear Rims							
Type	R14	R24	R38	R42	R48	R65	R90
<b>B [mm]</b>	9.7	8.6	13.3	15.7	17.7	22.2	32.3
<b>B<sub>min</sub> [mm]</b>	7.7	5.6	10.3	11.7	13.7	17.2	24.3

**Table 2:** Limiting wear values for coupling gear rims

For gear couplings, the limiting wear value is  $X = 0.8$  mm, as shown in the following illustration.



**Figure 4 :** Measurement of gear sleeve wear for gear BoWex® couplings

#### Explanation :

1. Sleeve
2. Hub



#### 3.6 Gear Unit Operating



#### EXPLOSION !

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

- 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.
- If the gear unit is equipped with a cooling coil, it may only be put into operation if the cooling coil has been connected to the cooling circuit and the cooling circuit is in operation. The temperature of the cooling fluid and the cooling fluid flow rate must be monitored and ensured by the operator.
- 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,  $n_{1min} = 900$  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) are detected, or the temperature sticker has turned black, the gear unit must be shut down and Getriebebau PGR must be consulted.



#### 4.1 Control And Periodic Maintenance

	<p><b>EXPLOSION !</b></p> <p><b>Explosion hazard:</b> Failure to comply may cause severe or even fatal injuries. Before commissioning, the oil level must be checked with the supplied dipstick.</p>
	<p><b>DANGER !</b></p> <p><b>Danger of burns due to hot oil:</b></p> <ul style="list-style-type: none"> <li>• Allow the gear unit to cool down before carrying out maintenance or repair work.</li> <li>• Wear protective gloves.</li> </ul>

The installation position must comply with the version on the type plate. Section 5.1 "Mounting Positions" describes the versions and the corresponding oil level screws. With double gear units, the oil level must be checked on both units. The pressure vent must be at the position marked in Section 5.1 "Mounting Positions". The oil level does not need to be checked on gear units without oil level screw (please see chapter 3.3 "Gear Unit Ventilation").

Gear unit types that are not supplied full of oil must be filled before the oil level is checked. (please see chapter 6.2 "Lubricant Fill Quantities").

Check the oil level with an oil temperature of between 20 °C to 40 °C.

#### Checking The Oil Level:

1. The oil level may only be checked when the gear unit is at a standstill and has cooled down. The gear unit must be secured to prevent accidental switch-on.
2. **Gear units with oil level screw:**
  - The oil level screw corresponding to the version must be screwed out (please see chapter 4.1 "Control And Maintenance").
  - Please control oil(lubricant) level at the gearbox.
  - Maximum oil(lubricant) level would be top of the hole of oil level.
  - The minimum oil level is approx. 4 mm below the lower edge of the oil level hole. The dipstick then just dips into the oil.
  - If the oil level is not correct, it must be adjusted by draining off oil or topping up with the type of oil stated on the type plate.
  - If the integrated seal of the oil level screw is damaged, a new oil level screw must be used or the thread cleaned and coated with securing adhesive, e. g. Loctite 242, Loxeal 54-03 prior to insertion.
  - Fit the oil level screw together with the sealing ring and tighten to the correct torque (please see chapter 3.2.1 "Bolt Tightening Torque Value").
  - If the pressure vent has been unscrewed, reinsert it together with the sealing ring and tighten to the correct torque (please see chapter 3.2.1 "Bolt Tightening Torque Value").
  - Mount all removed attachments again.
3. **Gear units with oil inspection glass:**
  - The oil level can be seen directly in the window.
  - The correct oil level is: the middle of the oil inspection glass.
  - If the oil level is not correct, it must be adjusted by draining off oil or topping up with the type of oil stated on the type plate.
4. **Final check:**
  - All previously removed screws must be screwed back in correctly.



## 4. CONTROL AND MAINTENANCE

### 4.1.1 Service and Maintenance Time Periods

Service and Maintenance Intervals	Service and Maintenance Work	Information see Section
Weekly or every 100 operating hours.	<ul style="list-style-type: none"> <li>• Visual inspection for leaks.</li> </ul>	4.4
	<ul style="list-style-type: none"> <li>• Check the gear unit for unusual running noises and/or vibrations.</li> </ul>	4.3
	<ul style="list-style-type: none"> <li>• Only for gear units with cooling cover: Visual inspection of the temperature sticker.</li> </ul>	3.4 3.4.1
Every 2500 operating hours, at least every six months.	<ul style="list-style-type: none"> <li>• Check the oil level.</li> </ul>	4.1
	<ul style="list-style-type: none"> <li>• Visual inspection of the rubber buffer.</li> <li>• Visual inspection of shaft sealing ring.</li> </ul>	4.2
	<ul style="list-style-type: none"> <li>• Visual inspection of the temperature sticker.</li> </ul>	3.4
	<ul style="list-style-type: none"> <li>• Remove dust. (Only for category 2D).</li> </ul>	-
	<ul style="list-style-type: none"> <li>• Check the coupling (Only for category 2G and standard IEC / NEMA motor attachment).</li> </ul>	3.5
	<ul style="list-style-type: none"> <li>• Clean or replace the pressure vent screw.</li> </ul>	3.3
For operating temperatures up to 80 °C every 10000 operating hours at least every 2 years.	<ul style="list-style-type: none"> <li>• Change the oil. (The interval is doubled if filled with synthetic products).</li> </ul>	4.5
Every 20000 operating hours at least every 4 years.	<ul style="list-style-type: none"> <li>• Re-lubrication of the bearings in the gear unit.</li> </ul>	6.1
Interval as stated in field MI of the type plate (only for Category 2G and 2D) or at least every 10 years.	<ul style="list-style-type: none"> <li>• General overhaul.</li> </ul>	4.11

**Table 3 :** Service and maintenance time periods



## 4.2 Visual Inspection

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

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

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

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

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

	<b>EXPLOSION !</b>
	<p><b>Explosion hazard:</b> 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.</p> <p><b>The drive unit must be inspected and may only be installed if:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• No leakage or no oil loss is visible.</li> <li>• No corrosion or other indications of incorrect or damp storage is apparent.</li> <li>• The packaging material has been completely removed.</li> </ul>

## 4.3 Check for Running Noises

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

	<b>EXPLOSION !</b>
	<p>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.</p>

### Visual inspection of the temperature sticker;

Only necessary for temperature class T4 or max. surface temperature < 135 °C.

	<b>NOTE !</b>
	<p><b>Shaft sealing rings;</b> Shaft sealing rings are rubbing seals and have sealing lips made from an elastomer material. These sealing lips are lubricated with a special grease at the factory. This reduces the wear due to their function and ensures a long service life.</p>

	<b>EXPLOSION !</b>
	<p>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.</p>



## 4. CONTROL AND MAINTENANCE

### 4.4 Control Of The Lubricant And Lubricant Level



#### EXPLOSION !

**Explosion hazard:** Failure to comply is likely to cause severe or even fatal injuries. The gear unit must be checked for leaks. Attention should be paid to escaping gear oil and traces of oil on the exterior or underneath the gear unit. 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 Changing the Oil



#### 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 catalogue could be seen. When the oil-changing process, the gear unit should be at operating temperature. Connection of driving unit must be cut and be secured for incorrect reactivation.



#### NOTE !

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

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

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

### 4.6 Oil Plugs Squeezing Torc Chart

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

Table 4 : Oil Plugs Squeezing Torc Chart



#### 4.7 Temperature Measurement

The details of the ATEX temperature class or the maximum surface temperature are based on normal installation conditions (please see chapter 3.4 "Temperature Sticker"). Even small changes to the installation conditions can have a significant effect on the temperature of the gear unit.

	<b>EXPLOSION !</b>
	<p><b>Explosion hazard:</b> Failure to comply may cause severe, or even fatal injuries.</p> <p>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.)</p>

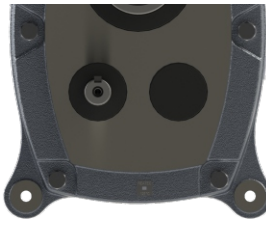
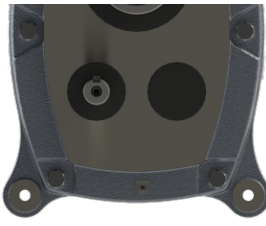


For the temperature measurement, a normal temperature measuring device is required, with a measurement range from 0 °C to 130 °C and a precision of at least  $\pm 4$  °C and which enables the measurement of the surface temperature and the temperature of the air. Temperature measurement procedure:

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<sub>gm</sub>" must be measured close to the temperature indication label.
3. Measure the temperature of the air "T<sub>um</sub>" in the immediate vicinity of the gear unit.

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

- The measured air temperature "T<sub>um</sub>" is within the permissible range stated on the type plate;
- The measured temperature of the surface of the gear unit housing "T<sub>gm</sub>" is below 121 °C and the temperature indication label has not turned black (see Picture 1).
- The measured temperature of the surface of the gear unit housing plus the difference between the highest permissible air temperature "T<sub>u</sub>" 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	:	$T_{gm} + T_u - T_{um} < 135\text{ °C} - 15\text{ °C}$
ATEX labelling: II 2D Ex h IIC T120°C Db	:	$T_{gm} + T_u - T_{um} < T_{max} - 15\text{ °C}$
T <sub>gm</sub> : Measured temperature of the surface of the gear unit housing in °C		
T <sub>um</sub> : Measured air temperature in °C		
T <sub>max</sub> : Maximum surface temperature according to gear unit type plate (ATEX labelling) in °C		
T <sub>u</sub> : Upper value of the permissible ambient temperature range according to the type plate in °C		

P SERIES		Pt/ASERIES	
			
Midpoint <b>White</b> : Temperature is normal.	Midpoint <b>Black</b> : Temperature is very high.	Midpoint <b>White</b> : Temperature is normal.	Midpoint <b>Black</b> : Temperature is very high.

**Picture 2:** Temperature Sticker



## 4. CONTROL AND MAINTENANCE

### 4.8 Operation With Frigorific



#### EXPLOSION !

**Explosion hazard:** Failure to comply may cause severe, or even fatal injuries.  
The temperature of the cooling water and the cooling water flow rate must be supervised and ensured by the operator.  
The ATEX approval is void if these instructions are not observed!



#### ATTENTION !

The gear unit may be damaged by overheating.  
The drive may only be commissioned after the cooling spiral has been connected to the cooling circuit, and the cooling circuit has been put into operation.

Operation with lubricant cooling The coolant must have a similar thermal capacity as water (specific thermal capacity at 20°C  $c=4.18 \text{ kJ/kgK}$ ). Industrial water without any air bubbles or sediments is recommended as a coolant. The hardness of the water must be between 1 dH and 15 dH; the pH value must be between pH 7.4 and pH 9.5. No aggressive liquids may be added to the coolant!

The coolant pressure must not exceed 8 bar. The required quantity of coolant is 10 litres/minute, and the coolant inlet temperature must not exceed 40°C; we recommend 10°C.

We also recommend fitting a pressure reducer or similar at the coolant inlet to avoid damage due to excessive pressure.

If there is a danger of frost the operator should add a suitable anti-freeze solution to the cooling water.

### 4.9 Change of the Oil Seal And Oil Cover

- Connection of driving unit must be cut and be secured for incorrectly reactivation.
- At the time oil seal is changing, the sufficient amount of grease must be found between leakproofing lips and should be paid attention that the surface is not dirty and dusty.
- When the double seal is used, 3/2 of the part which remained between two seal must be filled with grease convenient to the oil type inside the gear unit.
- During the change of the oil seal the proper devices must be used for not to harm the body and shaft.
- During the change of the oil seal and oil filler cup, the original product must be used.





#### 4.10 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, the gear unit should be checked for:

- Leaks,
- Slippage of the shrink disks. For this, the cover must be removed and a check carried out whether the marking described in (Section 7.1 "Shrink Disc" ) shows a relative movement of the hollow shaft of the gear unit and the machine shaft.

##### 4.10.1 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?	3.3
Are contact guards fitted to rotating components?	4.7
Does the motor also have a relevant ATEX approval?	4.1
Is the temperature sticker affixed?	3.4
Has the correct oil level for the configuration been checked?	4.1 4.4
Has the temperature measurement been carried out?	4.7
Has the centre of the temperature sticker turned black?	4.8
Is the cooling cover connected to the cooling circuit?	4.10
Has the gear unit been checked with a test run?	4.10

**Table 5 :** Checklist



## 4. CONTROL AND MAINTENANCE

### 4.11 General Overhaul

	<p><b>EXPLOSION !</b></p> <p><b>Explosion hazard:</b> Failure to comply is likely to cause severe or even fatal injuries.</p> <ul style="list-style-type: none"> <li>• No explosive atmosphere must be present during servicing and repair work. Servicing and maintenance work must only be performed by qualified specialist personnel.</li> <li>• 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.</li> </ul>
	<p><b>ATTENTION !</b></p> <p>Severe personal injury;</p> <ul style="list-style-type: none"> <li>• Severe injury and material damage may be caused by incorrect servicing and maintenance work.</li> <li>• 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.)</li> </ul>

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:

$$N_A = C_M \cdot f_L \cdot k_A$$

$N_A$ : 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,  $k_A = 1$

	<p><b>ATTENTION !</b></p> <p>The general revision should be made by the qualified personnel with considering the international laws and regulations in the plants which has the required equipments. We recommend that the general revision has to be made at the PGR service.</p>
---	--

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:

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



### **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:

- Clean all gear unit components,
- Examine all gear unit components for damage,
- The damaged parts must be changed with original part,
- All roller bearings must be replaced,
- Replace back stops if fitted,
- Replace all seals, radial seals and Nilos rings,

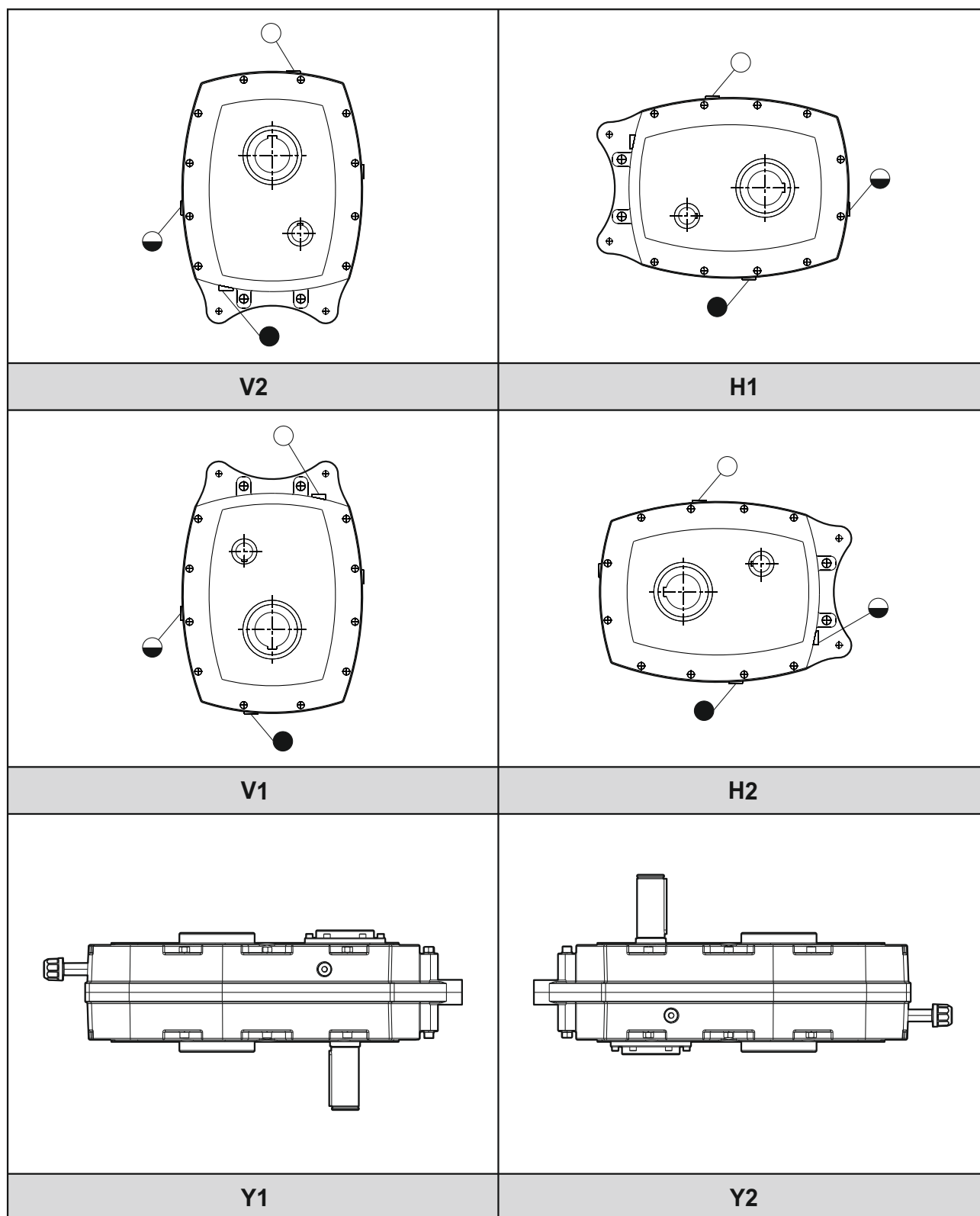


## 5. MOUNTING POSITIONS

### 5.1 Mounting Positions

Install the gearbox at the projected mountage position. For the other mountage positions except this one, please consult to our Technical Service.

### P SERIES



○ Vent (Filler) plug

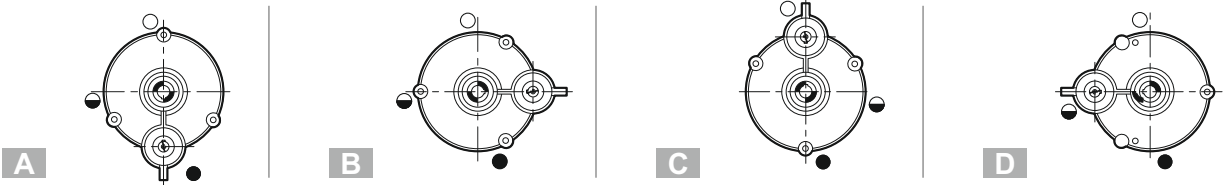
◐ Level plug

● Drain plug

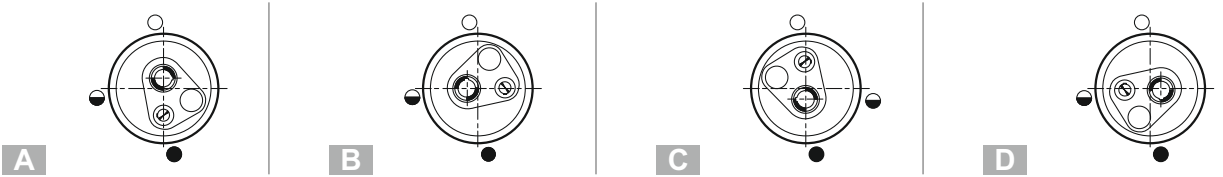


## Pt / A SERIES

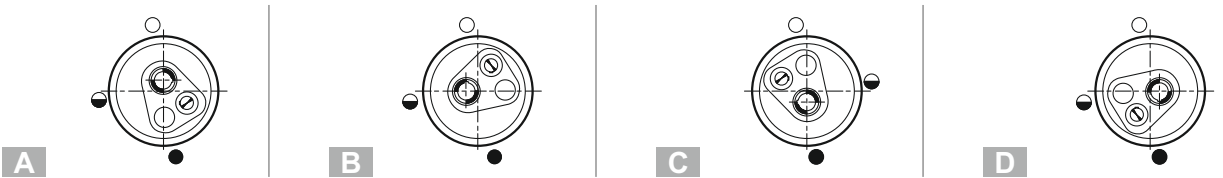
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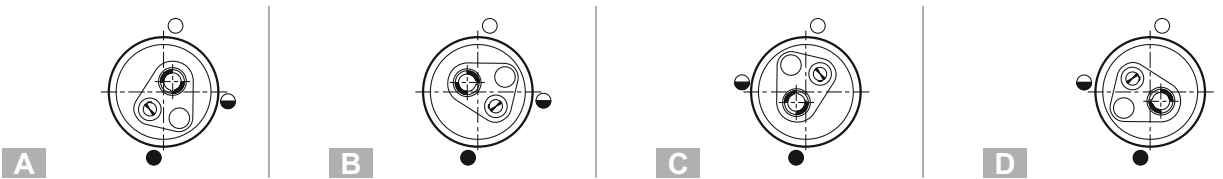
Pt/A 35



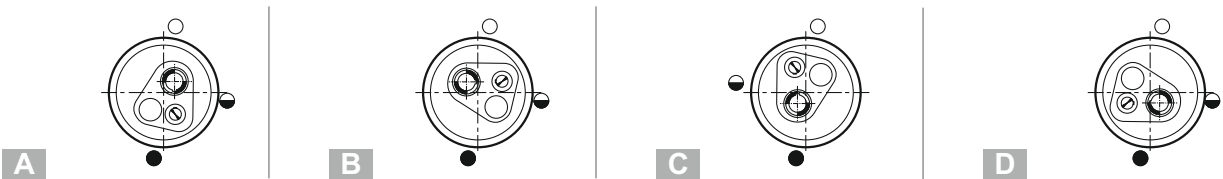
Pt/A 35\_D



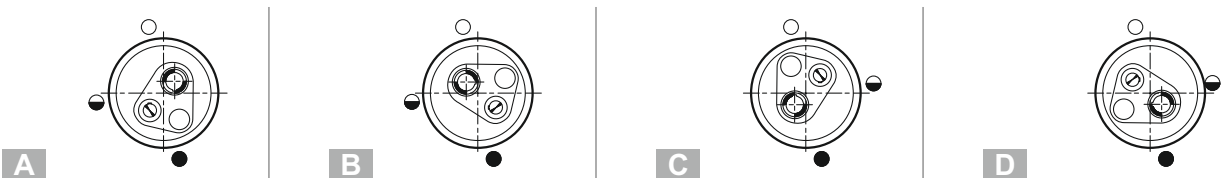
Pt/A 40



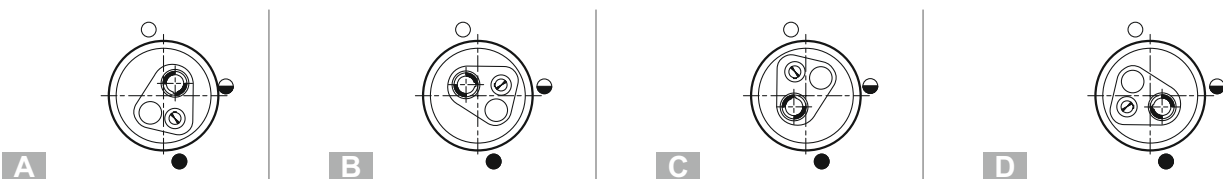
Pt/A 40\_D



Pt/A 45



Pt/A 45\_D



○ Vent (Filler) plug

◐ Level plug

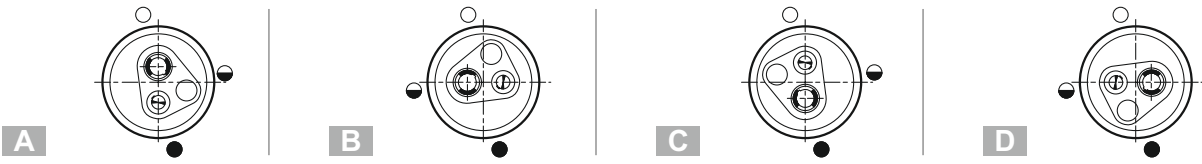
● Drain plug



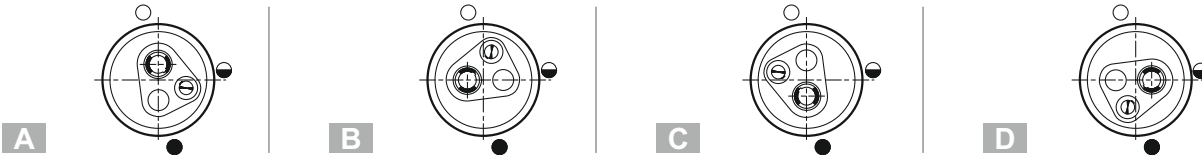
## 5. MOUNTING POSITIONS

### Pt / A SERIES

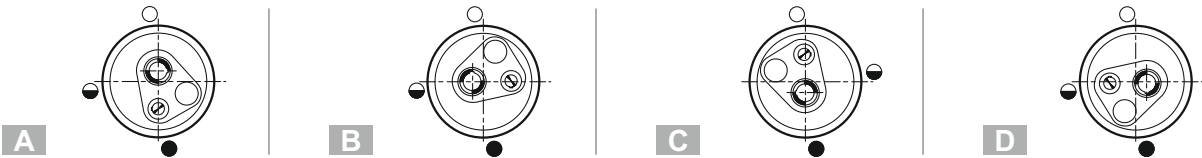
Pt/A 50



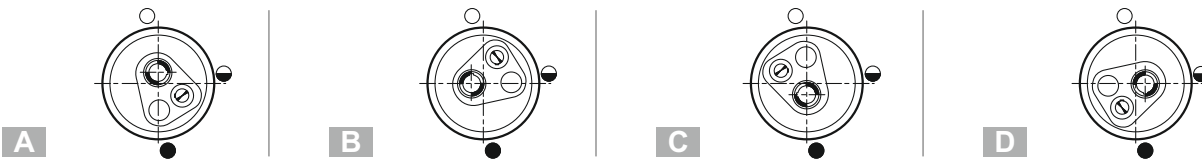
Pt/A 50\_D



Pt/A 60



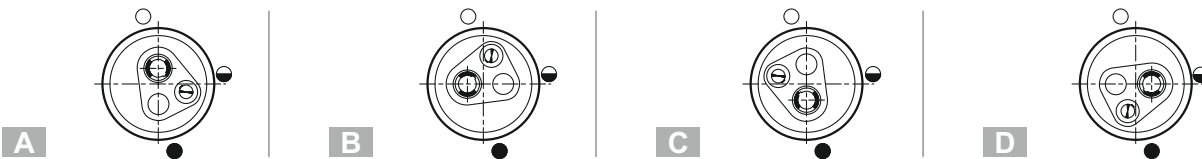
Pt/A 60\_D



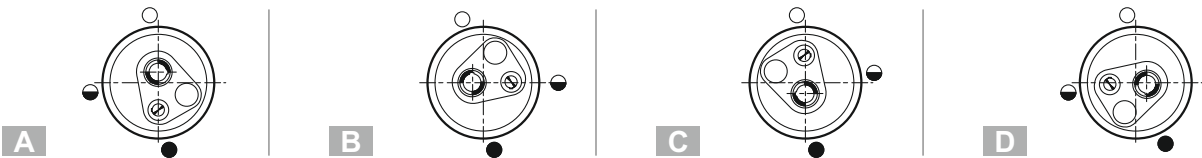
Pt/A 70



Pt/A 70\_D



Pt/A 80



Pt/A 80\_D



○ Vent (Filler) plug

◐ Level plug

● Drain plug



## Pt / A SERIES

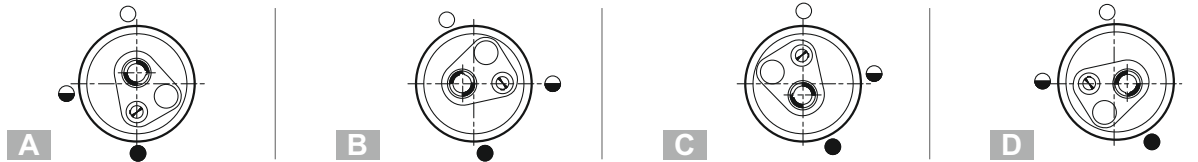
Pt/A 100



Pt/A 100\_D



Pt/A 125



Pt/A 125\_D



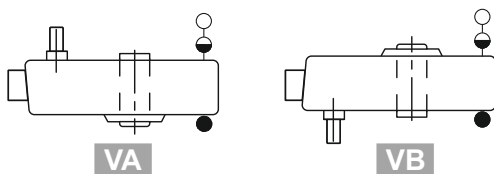
○ Vent (Filler) plug

◐ Level plug

● Drain plug

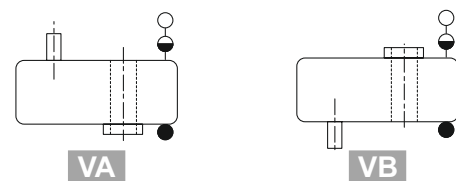
### 5.2 Mounting Positions For Where Input Shaft Is Vertical

Pt/A 30



Pt/A 35 & Pt/A 125

Pt/A 35\_D & Pt/A 125\_D





## 5. MOUNTING POSITIONS

### 5.3 V Belt and Torc Arm Connection

The V belt could be placed to every suitable position. If the torc arm is going to be used for tighten the belt, the angle between input and output shafts would be 90°. If it is wanted, V belt could be placed to right side.

The pulley must be mounted as nearest as possible to the gearbox's input shaft. If it is not made, the excessive load could occur at the input shaft and because of this reason they could be deteriorated very early.

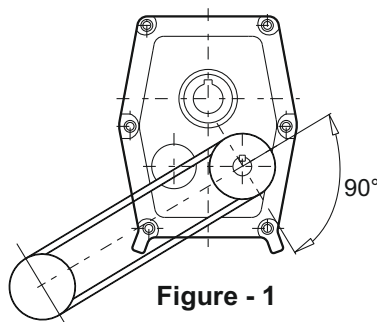


Figure - 1

If the output shafts work opposite to the clockwise, torc arm should be placed to the right side.

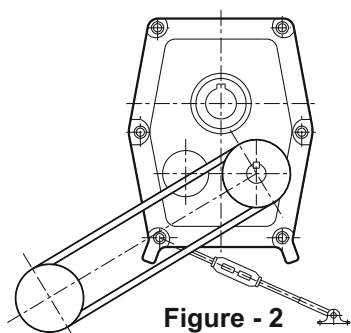
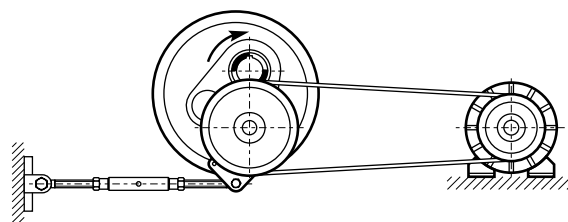


Figure - 2

#### TORC TENSION ARM



#### NOTE !

Torc arms should be mounted without tension. (Please look at P series catalogue).  
For enabling optimum mountage the paste should be used to absorb vibration.  
(LOCTITE 510 or equivalent product)

The torc arm supported-tappet is connected to fixed hinge. It must also be placed in such a way that the angle between the output shaft and torc arm connection screw is going to be placed vertical angle. It differs up to maximum 15 degree. If it is wanted, torc arm could be placed to the right side too.

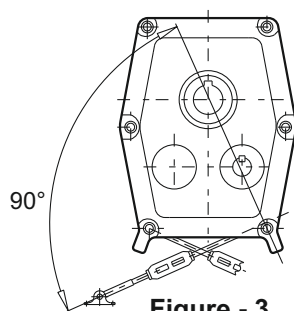


Figure - 3



#### NOTE !

Our firm is not responsible of the misuse of the original parts of the gearboxes.  
The supply of the torc arm belongs to customer.





## 6.1 Lubrication

The gearboxes are sent with oil unless the customer wants contrary. The oil added gearboxes are supplied with ventilation, level and draining plugs. The certain mounting positions must be determined in customer orders.

The inner pieces of gearboxes are lubricated within the oil or by spillage. At the given tables oil amounts which must be put according to different mountage positions and in respect to that plug positions are determined. In particular situations a probability of small quantity of oil-loss could exist apart from the oil amounts given from table.

	<b>DANGER !</b>
	In the situations of not using the stated amount of oil out of the table the probability of emerging a damage at the gearbox could be high.

## 6.2 Lubricant Fill Quantities

### P SERIES

LITRE (L)	V2	H1	V1	H2	V2	H1	V1	H2
	5:1				13:1 / 20:1			
P1	0.5	0.5	0.5	0.6	0.4	0.6	0.5	0.6
P2	0.8	0.9	0.8	1.0	0.7	0.9	0.8	0.9
P3	1.2	1.7	1.4	1.8	1.0	1.8	1.4	1.6
P4	2.5	2.6	2.4	2.5	2.3	2.6	2.4	2.2
P5	3.3	3.2	3.2	3.3	3.0	3.2	3.2	3.2
P6	4.1	5.3	4.1	5.8	3.8	5.5	4.2	5.1
P7	5.7	8.6	5.9	8.6	5.4	8.5	5.9	8.3
P8	10.9	18.4	13.6	18.4	9.1	16.4	12.6	15.4
P9	—	—	—	—	12.7	21.7	15.7	19.2
P10	—	—	—	—	12.5	13.5	24.0	11.5
P11	—	—	—	—	22.5	34.5	52.0	27.0
P12	—	—	—	—	36.0	50.0	79.0	45.0

### Pt / A SERIES

Pt/A 30	Pt/A 35	Pt/A 40	Pt/A 45	Pt/A 50	Pt/A 60	Pt/A 70	Pt/A 80	Pt/A 100	Pt/A 125
0.50	1.2	2.1	3.1	8.0	7.5	11.0	17.0	20.0	27.0
	Pt/A 35_D	Pt/A 40_D	Pt/A 45_D	Pt/A 50_D	Pt/A 60_D	Pt/A 70_D	Pt/A 80_D	Pt/A 100_D	Pt/A 125_D
	1.1	1.8	3.6	7.3	10.0	14.0	11.0	18.0	27.0



## 6. LUBRICATION

### 6.3 Lubricant Selection

#### P SERIES

Mineral Oils												
	Room temperature	0-100 min <sup>-1</sup>	101-200 min <sup>-1</sup>	201- 400 min		0-20 min <sup>-1</sup>	21- 50 min <sup>-1</sup>		51-120 min <sup>-1</sup>		0-50 min <sup>-1</sup>	51-80 min <sup>-1</sup>
		P1 P2 P3 P5 P6 P7 P8	P1 P2 P3 P5 P6 P7 P8	P1 P2	P3 P4 P5 P6 P7 P8	P1 P2 P3 P4 P5 P6 P7 P8 P9	P1 P2 P3	P4 P5 P6 P7 P8 P9	P1 P2 P3	P4 P5 P6 P7 P8 P9	P10 P11 P12	P10 P11 P12
I.S.O. Viscosity	-10 / +5	100	100	100	68	150	150	150	100	100	100	100
	6 / 25	460	320	320	220	680	680	460	460	320	320	220
	26 / 40	800	680	680	460	800	800	800	680	460	460	320
		5 : 1				13 : 1			20 : 1			

#### Pt / A SERIES

Type of Loads	Pt/A 0 °C - 20 °C		Pt/A 20 °C - 40 °C	
	Mineral Oil ISO VG	Synthetic Oil ISO VG	Mineral Oil ISO VG	Synthetic Oil ISO VG
Uniform load	150	150	220	220
Medium Load	150	150	320	220
Heavy Load	200	200	460	320



## 6.4 Lubricant Table

At below table, registered brands or names of goods have been showed according to gearbox lubricant type which stated on product label. (Please also see Part "2.1 Gearbox Label". This situation means that just a product should be used convenient to the lubricant type that shown on the label. In particular situations, stated product's name is shown on gearbox product label.

Type of gearbox	Type of Lubricant	Ambient Temp. °C	ISO viscosity class	Shell	Mobil	bp	Esso	DEA	ARAL	Castrol	TRIBOL	KLÜBER LUBRICATION
Helical Gear-boxes	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 Alrkraft Hydraulic Oil 15	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		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
Anti Friction Bearings	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
	Synthetic fluid grease	- 35...60		Shell Tivela compound A		Enersyn GSF	Fliessfett S 420	Glissando 6833 EP 00	Aralub SKA 00	Alpha Gel 00	Tribol 800/1000	Klübersynth GE 46 -1200
	Mineral oil grease	- 30...60 Normal # 50...110		Alvania Fett R 3 oder Alvania Fett RL 3	Mobil SHC Polyrex 005 Mobilux 3 Mobilux 2	Energrease LS 3 Energrease LS 2	Beacon 3 Beacon 2	Glissando 30 Glissando 20 Glissando FT 3	Aralub HL 3 Aralub HL 2 Aralub BAB EP 2	Speherol AP 3 Speherol AP 2 LZV - EP Speherol EPL 2	Tribol 3030/100-2 Tribol 4020/220-2 Tribol 3785	Centoplex 3 Centoplex 2
	Synthetic grease	# - 50...110		Aero Shell Grease 16 oder 7	Mobiltemp SHC 32		Beacon 325	Discor 8 - EP 2	Aralub SKL 2	Product 783/46	Tribol 3499	Isoflex Topas NB52



### DANGER !

The synthetic and mineral oils must not be mixed with eachother.



### NOTE !

At ambient temperatures under -30° degree and above 60° degree for leakproofing element inside the shaft, special quality material must be used.

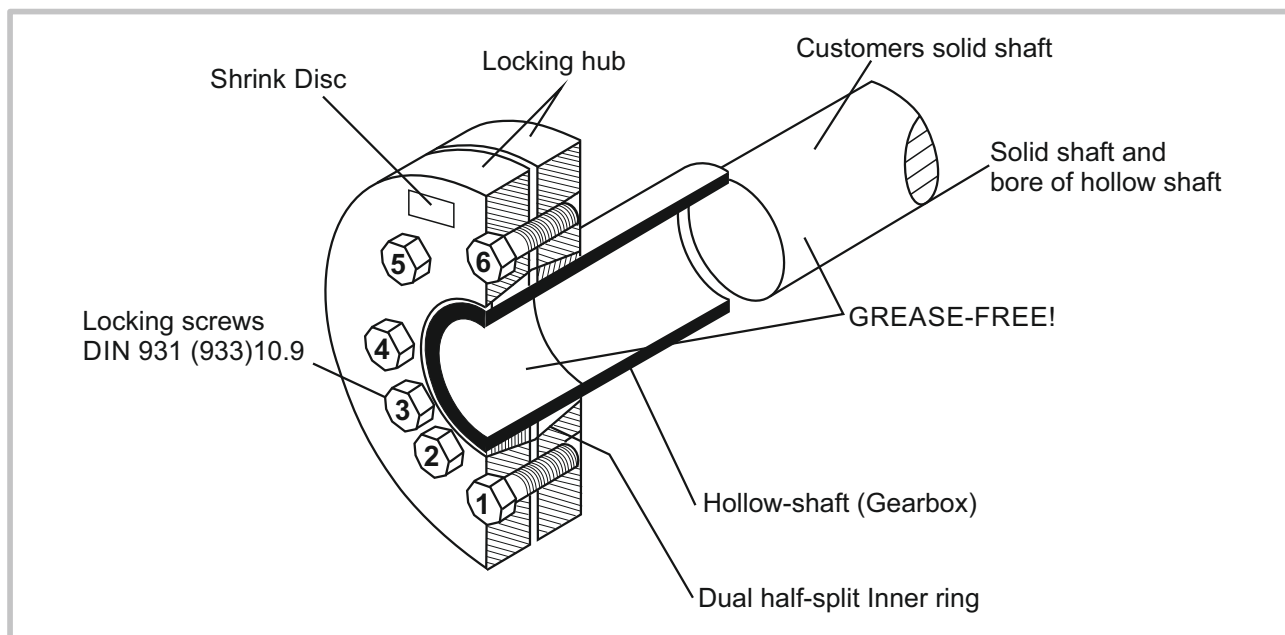


### NOTE !

This table lists compatible lubricants of different suppliers. Within the same viscosity class and type of lubricant the supplier can be chosen freely. In case you change the viscosity class resp. The type of lubricant you should contact us in advance otherwise we cannot assure the proper function of our drive and the warranty becomes void.



### 7.1 Shrink Disc



#### NOTE !

Shrink disc would be sent ready to assembly by manufacturer.  
Please do not segment the shrink disc into pieces before assembly process.  
There could be wounding risk during both assembly and disassembly.  
Please obey instructions given below,



#### NOTE !

Do not tighten screws on the shrink disc without installing the shaft.  
If it is tightened, hollow shaft could be damaged.

#### 7.1.1 Mounting Position Of The Shrink Disc;

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



### 7.1.2 Demounting Position Of The Shrink Disc;

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

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

### 7.1.3 Cleaning Of The Shrink Disc;

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

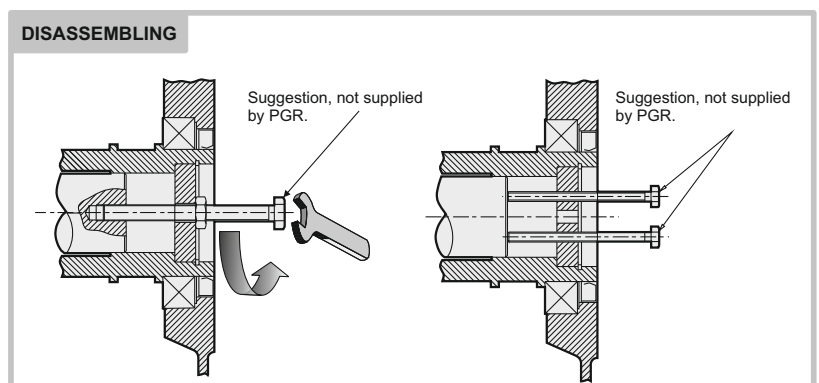
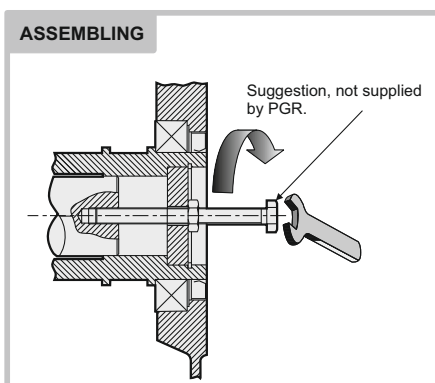
Lubricant (Mo S2)	Type
Molykote 321 (Slippery lac)	Spray
Molykote Spray (Powder spray)	Spray
Molykote G Rapid	Spray or paste
Aemasol MO 19P	Spray or paste
Aemasol DIO-setral 57 N (Slippery lac)	Spray

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

## 7.2 Fixing Elements

- Fixing elements are available as standard on P and Pt/A type of gear units.
- A hole should be opened in accordance with DIN 322/2 standarts at the center of the customer's solid shaft to use.

\* Before installation sufficient protection must be supplied for protect against rust, abrasion and blocking, like figure which is shown on below.

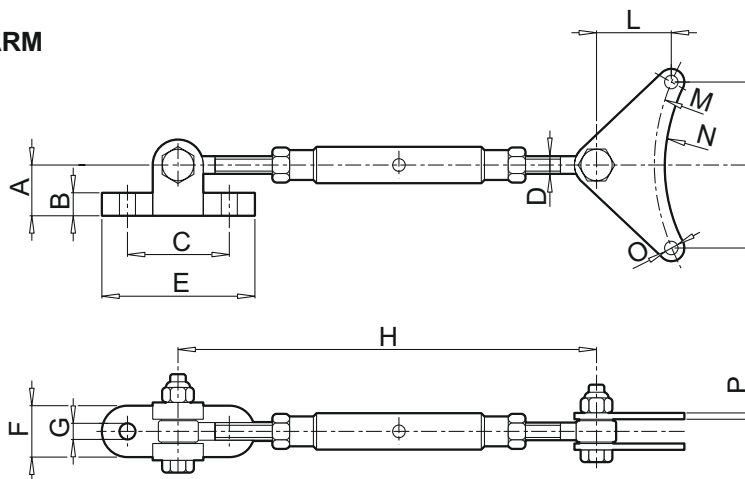





## 7. ACCESSORIES

### 7.3 Torque Arm Pt/A SERIES

TORC TENSION ARM



		C	F	G	E	D	I	M	N	P	L	B	O	A	H <sub>Min.</sub>	H <sub>Max.</sub>
Pt/A 35	35	50	25	8.5	75	M10	92	120	111	4	45	10	8.5	25	200	300
Pt/A 40	40 45	70	35	10.5	105	M12	115.5	151	143	4	51	16	8.5	35	210	310
Pt/A 45	45 50 55	70	35	10.5	105	M12	132	172	164	5	57	16	8.5	35	210	310
Pt/A 50	50 55 60	75	40	12.5	115	M14	157	205	195	5	70	18	10.5	40	240	360
Pt/A 60	60 70	75	40	12.5	115	M14	179	234	221	5	84	18	12.5	40	240	360
Pt/A 70	70 85	85	50	14.5	135	M16	199	260	247	6	100	20	12.5	45	260	410
Pt/A 80	80 100	85	50	14.5	135	M16	218	285	272	6	102	20	13	45	260	410
Pt/A 100	100 125	150	70	25	220	M20	258.5	337	324	10	115	30	17	65	340	560
Pt/A 125	125 135	150	70	25	220	M20	306	402.5	382	10	135	30	17	65	340	560




## 7.4 Backstop

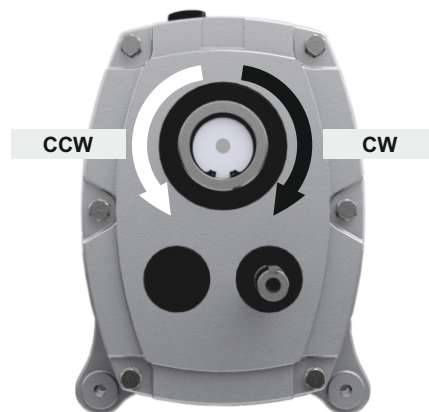
### P SERIES

Backstop system is available for all type of helical gear unit. Backstop system permits just one direction rotation it resists another direction rotation. Rotation speed is important for abration. Nearly 900 min and greater rotation speed influece abration.

Please, determine direction of rotation when you offer. Direction of rotation should be determined according to output shaft.

Arrows which is designated by 'CW' or 'CCW' shows locking direction from viewing at face of output shaft end.

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



**Arrows show that direction of rotation.**

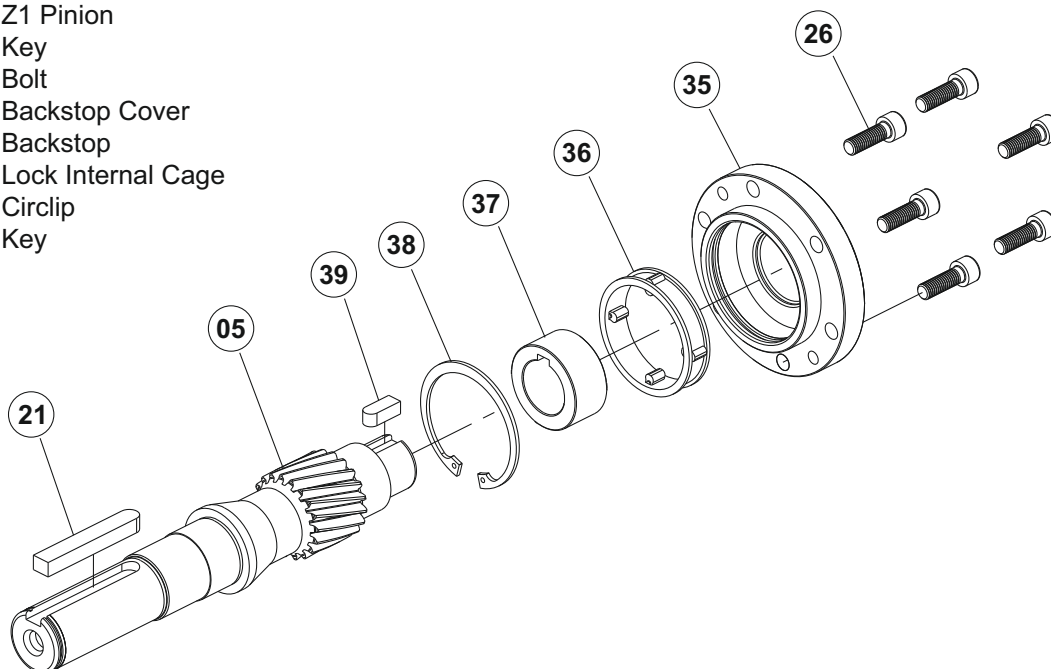


## 7. ACCESSORIES

### 7.5 Lock Blasting

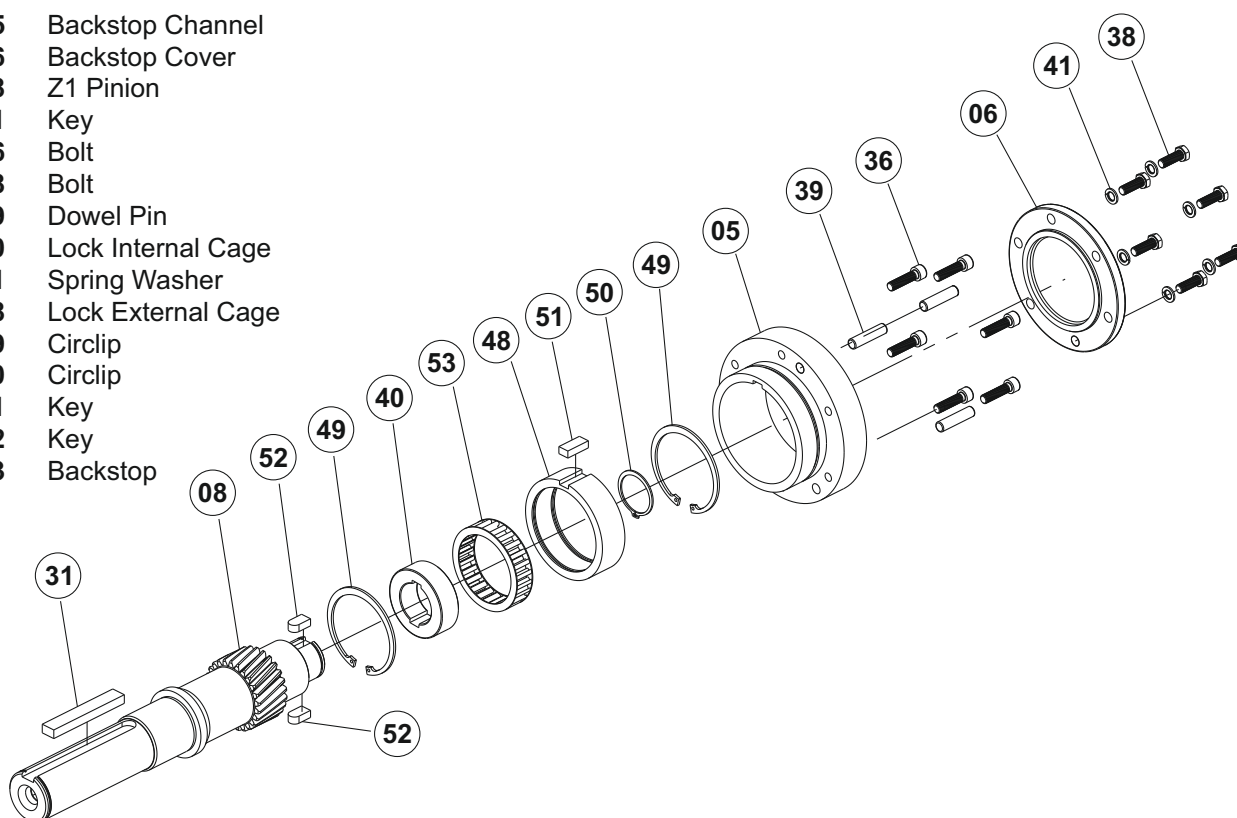
#### P1 ... P9

- 05 Z1 Pinion
- 21 Key
- 26 Bolt
- 35 Backstop Cover
- 36 Backstop
- 37 Lock Internal Cage
- 38 Circlip
- 39 Key



#### P9 ... P12

- 05 Backstop Channel
- 06 Backstop Cover
- 08 Z1 Pinion
- 31 Key
- 36 Bolt
- 38 Bolt
- 39 Dowel Pin
- 40 Lock Internal Cage
- 41 Spring Washer
- 48 Lock External Cage
- 49 Circlip
- 50 Circlip
- 51 Key
- 52 Key
- 53 Backstop





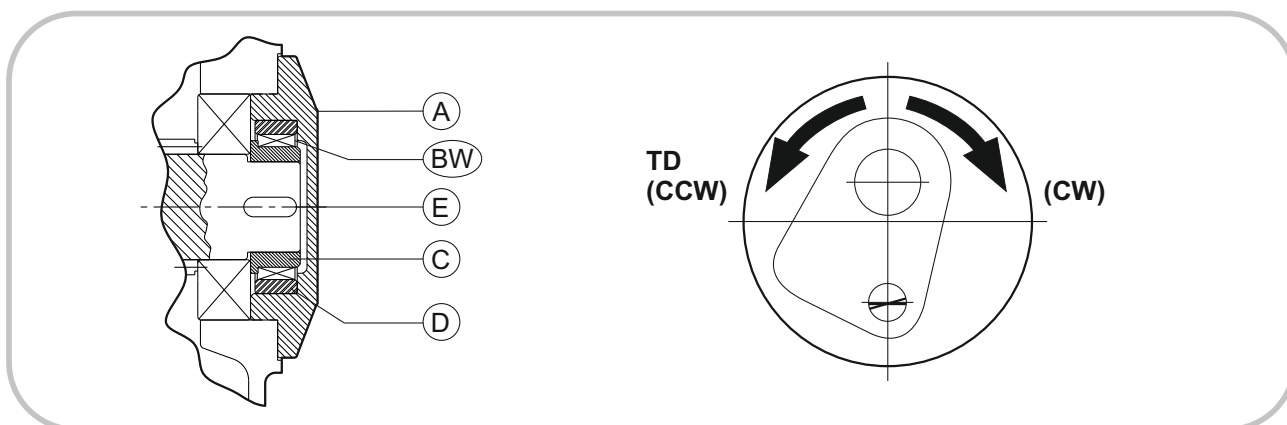


## Backstop

### Pt/A SERIES

If it is demanded, in gearboxes the lock up system which permitted just only to rotate to one side is available. (Pt/A, Pt/A\_D) The side choice must be defined at the order because of it is optional (right-left). The gearboxes sizes which are 40-45-50-100-125 (except 25-35/5-30-38) are designed for accepting BW lock as a standard. Sizes which are 35-60-70-80 are required to lock-up supporting element (A). The lock-up element could easily be mounted and demounted with following simple procedure below.

1. Take off cap A.
2. To place wedge E (except Pt/A 35.....Pt/A 45).
3. For the sizes 40-45-50-100-125 put liner bushing.
4. Put BW lock-up element to the seating part of locking placed inside of the cap. (or to the hinge cap).
5. Push to the lock-up element with both spreading a thick grease around of circle and implementing press onto the exterior part.
6. Place as a manuel (support cap) and turn for aligning around itself.
7. Control the rightness of the direction of rotation with spinning the input shaft and if it is not true mount lockup element reverse with repeating steps listed above.



**TD: CCW revolution of output shaft.**

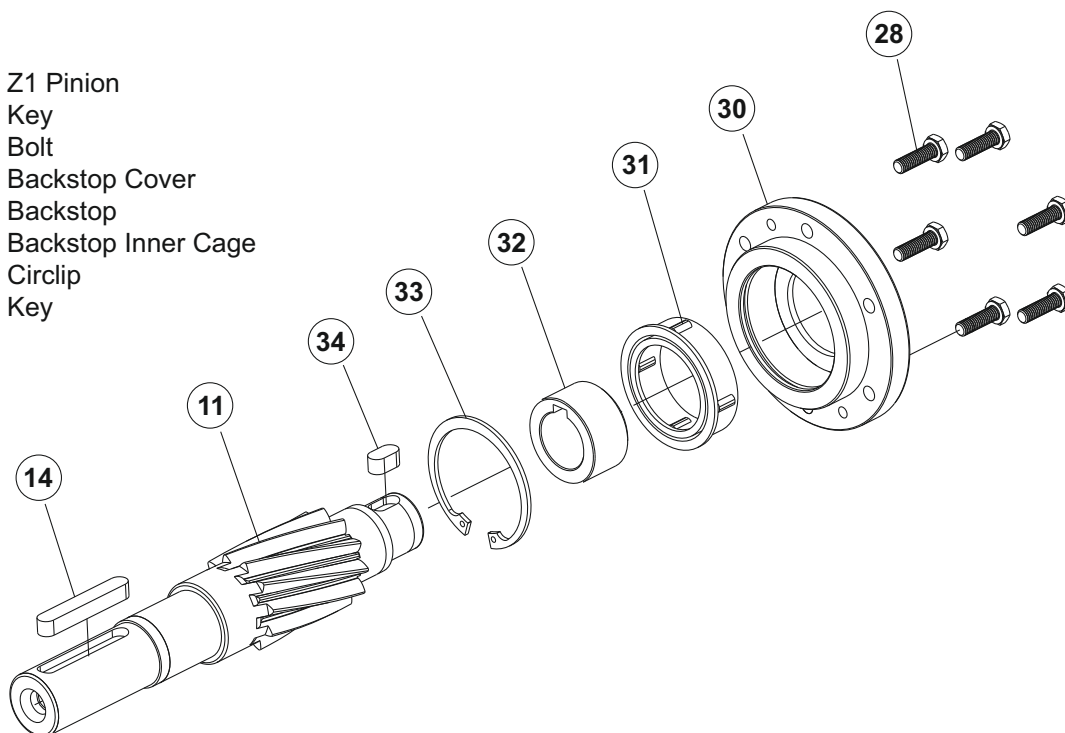


## 7. ACCESSORIES

### Lock Blasting

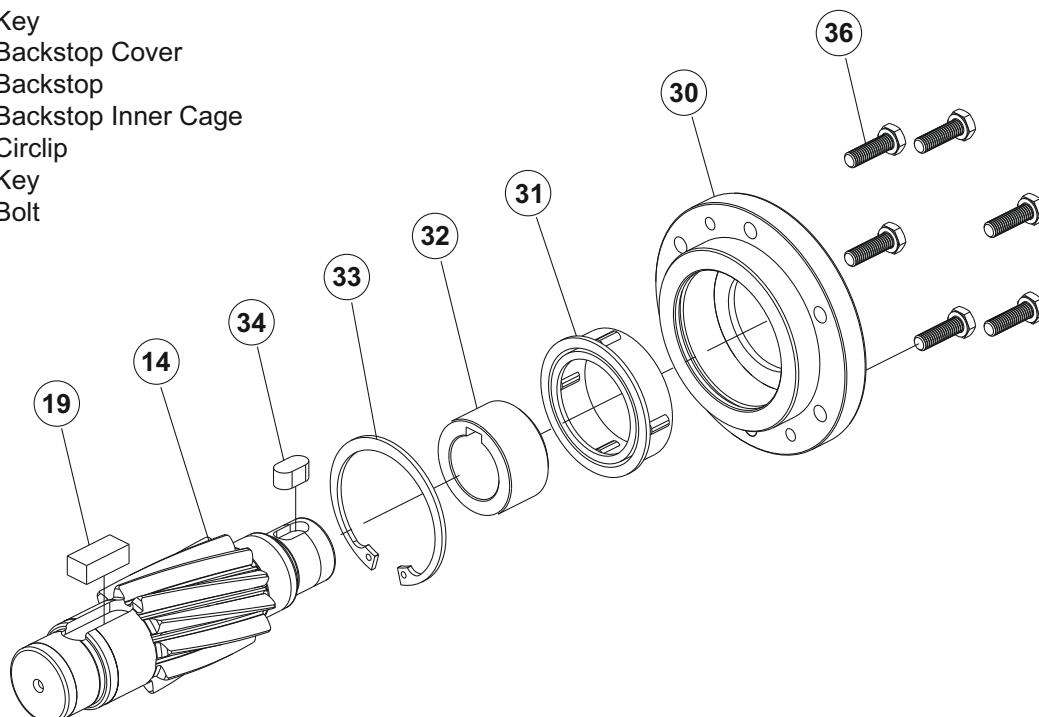
#### Pt/A SINGLE STAGE

- 11 Z1 Pinion
- 14 Key
- 28 Bolt
- 30 Backstop Cover
- 31 Backstop
- 32 Backstop Inner Cage
- 33 Circlip
- 34 Key



#### Pt/A DOUBLE STAGE

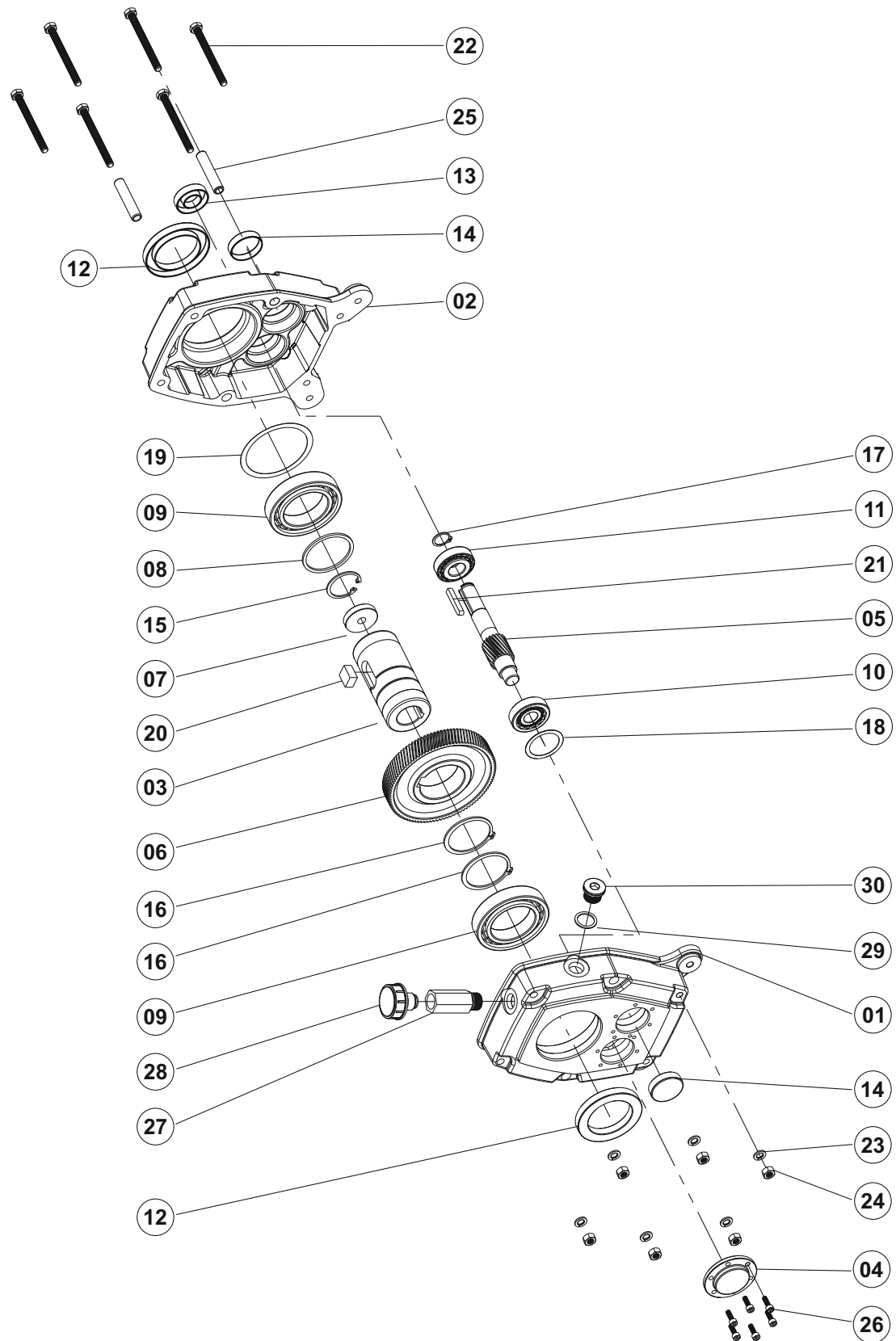
- 14 Z3 Pinion
- 19 Key
- 30 Backstop Cover
- 31 Backstop
- 32 Backstop Inner Cage
- 33 Circlip
- 34 Key
- 36 Bolt





7.6 Part List

P SINGLE STAGE



P1 ... P8



## 7. ACCESSORIES

### P Series

#### **P SINGLE STAGE**

##### **P1**

- 01 P1 Case A
- 02 P1 Case B
- 03 Output Shaft
- 04 Case Cover
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Washer
- 09 Bearing
- 10 Bearing
- 11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 16 Circlip (DIN 471)
- 17 Circlip (DIN 471)
- 18 Shim
- 19 Shim
- 20 Key B
- 21 Key AB
- 22 Bolt (DIN 933)
- 23 Spring Washer
- 24 Jacking Nut (DIN 934)
- 25 Centering Pin
- 26 Bolt (DIN 912)
- 27 Extension Plug
- 28 Vent Plug
- 29 Plug Washer
- 30 Oil Plug

##### **P3**

- 01 P3 Case A
- 02 P3 Case B
- 03 Output Shaft
- 04 Case Cover
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Washer
- 09 Bearing
- 10-11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 17 Circlip (DIN 471)
- 18 Shim
- 20 Key B
- 21 Key AB
- 22 Bolt (DIN 933)
- 23 Spring Washer
- 24 Jacking Nut (DIN 934)
- 25 Centering Pin
- 26 Bolt (DIN 912)
- 27 Extension Plug
- 28 Vent Plug
- 29 Plug Washer
- 30 Oil Plug

##### **P2**

- 01 P2 Case A
- 02 P2 Case B
- 03 Output Shaft
- 04 Case Cover
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Washer
- 09 Bearing
- 10-11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 17 Circlip (DIN 471)
- 18 Shim
- 19 Shim
- 20 Key B
- 21 Key AB
- 22 Bolt (DIN 933)
- 23 Spring Washer
- 24 Jacking Nut (DIN 934)
- 25 Centering Pin
- 26 Bolt (DIN 912)
- 27 Extension Plug
- 28 Vent Plug
- 29 Plug Washer
- 30 Oil Plug

##### **P4**

- 01 P4 Case A
- 02 P4 Case B
- 03 Output Shaft
- 04 Case Cover
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Washer
- 09 Bearing
- 10-11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 17 Segman (DIN 471)
- 18 Layner
- 20 Key B
- 21 Key AB
- 22 Bolt (DIN 933)
- 23 Spring Washer
- 24 Jacking Nut (DIN 934)
- 25 Centering Pin
- 26 Bolt (DIN 912)
- 27 Extension Plug
- 28 Vent Plug
- 29 Plug Washer
- 30 Oil Plug



**P Series**

**P SINGLE STAGE**

**P5**

- 01 P5 Case A
- 02 P5 Case B
- 03 Output Shaft
- 04 Case Cover
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Washer
- 09 Bearing
- 10-11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 17 Circlip (DIN 471)
- 18 Shim
- 20 Key B
- 21 Key AB
- 22 Bolt (DIN 933)
- 23 Spring Washer
- 24 Jacking Nut (DIN 934)
- 25 Centering Pin
- 26 Bolt (DIN 912)
- 27 Extension Plug
- 28 Vent Plug
- 29 Plug Washer
- 30 Oil Plug

**P7**

- 01 P7 Case A
- 02 P7 Case B
- 03 Output Shaft
- 04 Case Cover
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Washer
- 09 Bearing
- 10-11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 18 Shim
- 19 Shim
- 20 Key B
- 21 Key AB
- 22 Bolt (DIN 933)
- 23 Spring Washer
- 24 Jacking Nut (DIN 934)
- 25 Centering Pin
- 26 Bolt (DIN 912)
- 27 Extension Plug
- 28 Vent Plug
- 29 Plug Washer
- 30 Oil Plug

**P6**

- 01 P6 Case A
- 02 P6 Case B
- 03 Output Shaft
- 04 Case Cover
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Washer
- 09 Bearing
- 10-11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 17 Circlip (DIN 471)
- 18 Shim
- 20 Key B
- 21 Key AB
- 22 Bolt (DIN 933)
- 23 Spring Washer
- 24 Jacking Nut (DIN 934)
- 25 Centering Pin
- 26 Bolt (DIN 912)
- 27 Extension Plug
- 28 Vent Plug
- 29 Plug Washer
- 30 Oil Plug

**P8**

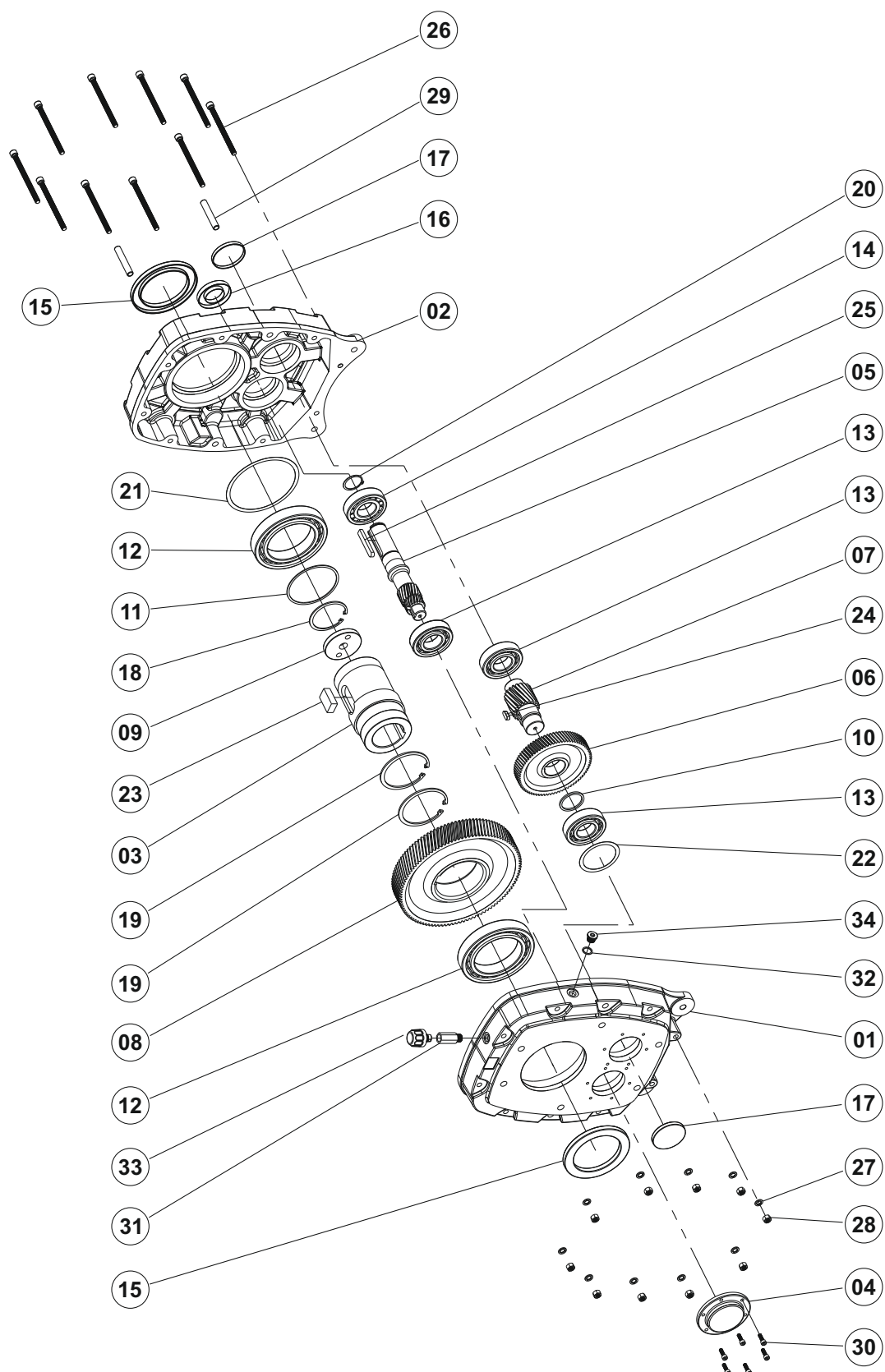
- 01 P8 Case A
- 02 P8 Case B
- 03 Output Shaft
- 04 Case Cover
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Washer
- 09 Bearing
- 10-11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 17 Segman (DIN 471)
- 18 Layner
- 20 Key B
- 21 Key AB
- 22 Bolt (DIN 933)
- 23 Spring Washer
- 24 Jacking Nut (DIN 934)
- 25 Centering Pin
- 26 Bolt (DIN 912)
- 27 Extension Plug
- 28 Vent Plug
- 29 Plug Washer
- 30 Oil Plug



## 7. ACCESSORIES

### P Series

#### P DOUBLE STAGE



**P1 ... P9**



**P Series**

**P DOUBLE STAGE**

<b>P1</b>	
01	P1 Case A
02	P1 Case B
03	Output Shaft
04	Case Cover
05	Z1 Pinion
06	Z2 Pinion
07	Z3 Pinion
08	Z4 Pinion
09	Socket Head Screw
10	Spacer
11	Washer
12	Bearing
13	Bearing
14	Bearing
15	Lubricating Seal
16	Lubricating Seal
17	Locking Cap
18	Circlip (DIN 472)
19	Circlip (DIN 471)
20	Circlip (DIN 471)
21	Shim
22	Shim
23	Key B
24	Key A
25	Key AB
26	Bolt (DIN 933)
27	Spring Washer
28	Jacking Nut (DIN 934)
29	Centering Pin
30	Bolt (DIN 912)
31	Extension Plug
32	Plug Washer
33	Vent Plug
34	Oil Plug

<b>P3</b>	
01	P3 Case A
02	P3 Case B
03	Output Shaft
04	Case Cover
05	Z1 Pinion
06	Z2 Pinion
07	Z3 Pinion
08	Z4 Pinion
09	Socket Head Screw
10	Spacer
11	Washer
12	Bearing
13	Bearing
14	Bearing
15	Lubricating Seal
16	Lubricating Seal
17	Locking Cap
18	Circlip (DIN 472)
20	Circlip (DIN 471)
23	Key B
24	Key A
25	Key AB
26	Bolt (DIN 933)
27	Spring Washer
28	Jacking Nut (DIN 934)
29	Centering Pin
30	Bolt (DIN 912)
31	Extension Plug
32	Plug Washer
33	Vent Plug
34	Oil Plug

<b>P2</b>	
01	P1 Case A
02	P1 Case B
03	Output Shaft
04	Case Cover
05	Z1 Pinion
06	Z2 Pinion
07	Z3 Pinion
08	Z4 Pinion
09	Socket Head Screw
10	Washer
11	Washer
12	Bearing
13	Bearing
14	Bearing
15	Lubricating Seal
16	Lubricating Seal
17	Locking Cap
18	Circlip (DIN 472)
20	Circlip (DIN 471)
21	Shim
22	Shim
23	Key B
24	Key A
25	Key AB
26	Bolt (DIN 933)
27	Spring Washer
28	Jacking Nut (DIN 934)
29	Centering Pin
30	Bolt (DIN 912)
31	Extension Plug
32	Plug Washer
33	Vent Plug
34	Oil Plug

<b>P4</b>	
01	P4 Case A
02	P4 Case B
03	Output Shaft
04	Case Cover
05	Z1 Pinion
06	Z2 Pinion
07	Z3 Pinion
08	Z4 Pinion
09	Socket Head Screw
10	Spacer
11	Washer
12	Bearing
13	Bearing
14	Bearing
15	Lubricating Seal
16	Lubricating Seal
17	Locking Cap
18	Circlip (DIN 472)
20	Circlip (DIN 471)
23	Key B
24	Key A
25	Key AB
26	Bolt (DIN 933)
27	Spring Washer
28	Jacking Nut (DIN 934)
29	Centering Pin
30	Bolt (DIN 912)
31	Extension Plug
32	Plug Washer
33	Vent Plug
34	Oil Plug



### P Series

#### **P DOUBLE STAGE**

##### **P5**

01	P5 Case A
02	P5 Case B
03	Output Shaft
04	Case Cover
05	Z1 Pinion
06	Z2 Pinion
07	Z3 Pinion
08	Z4 Pinion
09	Socket Head Screw
10	Spacer
11	Washer
12	Bearing
13	Bearing
14	Bearing
15	Lubricating Seal
16	Lubricating Seal
17	Locking Cap
18	Circlip (DIN 472)
20	Circlip (DIN 471)
23	Key B
24	Key A
25	Key AB
26	Bolt (DIN 933)
27	Spring Washer
28	Jacking Nut (DIN 934)
29	Centering Pin
30	Bolt (DIN 912)
31	Extension Plug
32	Plug Washer
33	Vent Plug
34	Oil Plug

##### **P6**

01	P6 Case A
02	P6 Case B
03	Output Shaft
04	Case Cover
05	Z1 Pinion
06	Z2 Pinion
07	Z3 Pinion
08	Z4 Pinion
09	Socket Head Screw
10	Washer
11	Washer
12	Bearing
13	Bearing
14	Bearing
15	Lubricating Seal
16	Lubricating Seal
17	Locking Cap
18	Circlip (DIN 472)
20	Circlip (DIN 471)
22	Shim
23	Key B
24	Key A
25	Key AB
26	Bolt (DIN 933)
27	Spring Washer
28	Jacking Nut (DIN 934)
29	Centering Pin
30	Bolt (DIN 912)
31	Extension Plug
32	Plug Washer
33	Vent Plug
34	Oil Plug





**P Series**

**P DOUBLE STAGE**

<b>P7</b>		<b>P8</b>	
01	P7 Case A	01	P8 Case A
02	P7Case B	02	P8 Case B
03	Output Shaft	03	Output Shaft
04	Case Cover	04	Case Cover
05	Z1 Pinion	05	Z1 Pinion
06	Z2 Pinion	06	Z2 Pinion
07	Z3 Pinion	07	Z3 Pinion
08	Z4 Pinion	08	Z4 Pinion
09	Socket Head Screw	09	Socket Head Screw
10	Washer	10	Washer
11	Washer	11	Washer
12	Bearing	12	Bearing
13	Bearing	13	Bearing
14	Bearing	14	Bearing
15	Lubricating Seal	15	Lubricating Seal
16	Lubricating Seal	16	Lubricating Seal
17	Locking Cap	17	Locking Cap
18	Circlip (DIN 472)	18	Circlip (DIN 472)
20	Circlip (DIN 471)	20	Circlip (DIN 471)
21	Shim	22	Shim
22	Shim	23	Key B
23	Key B	24	Key A
24	Key A	25	Key AB
25	Key AB	26	Bolt (DIN 912)
26	Bolt (DIN 912)	27	Spring Washer
27	Spring Washer	28	Jacking Nut (DIN 934)
28	Jacking Nut (DIN 934)	29	Centering Pin
29	Centering Pin	30	Bolt (DIN 912)
30	Bolt (DIN 912)	31	Extension Plug
31	Extension Plug	32	Plug Washer
32	Plug Washer	33	Vent Plug
33	Vent Plug	34	Oil Plug
34	Oil Plug		

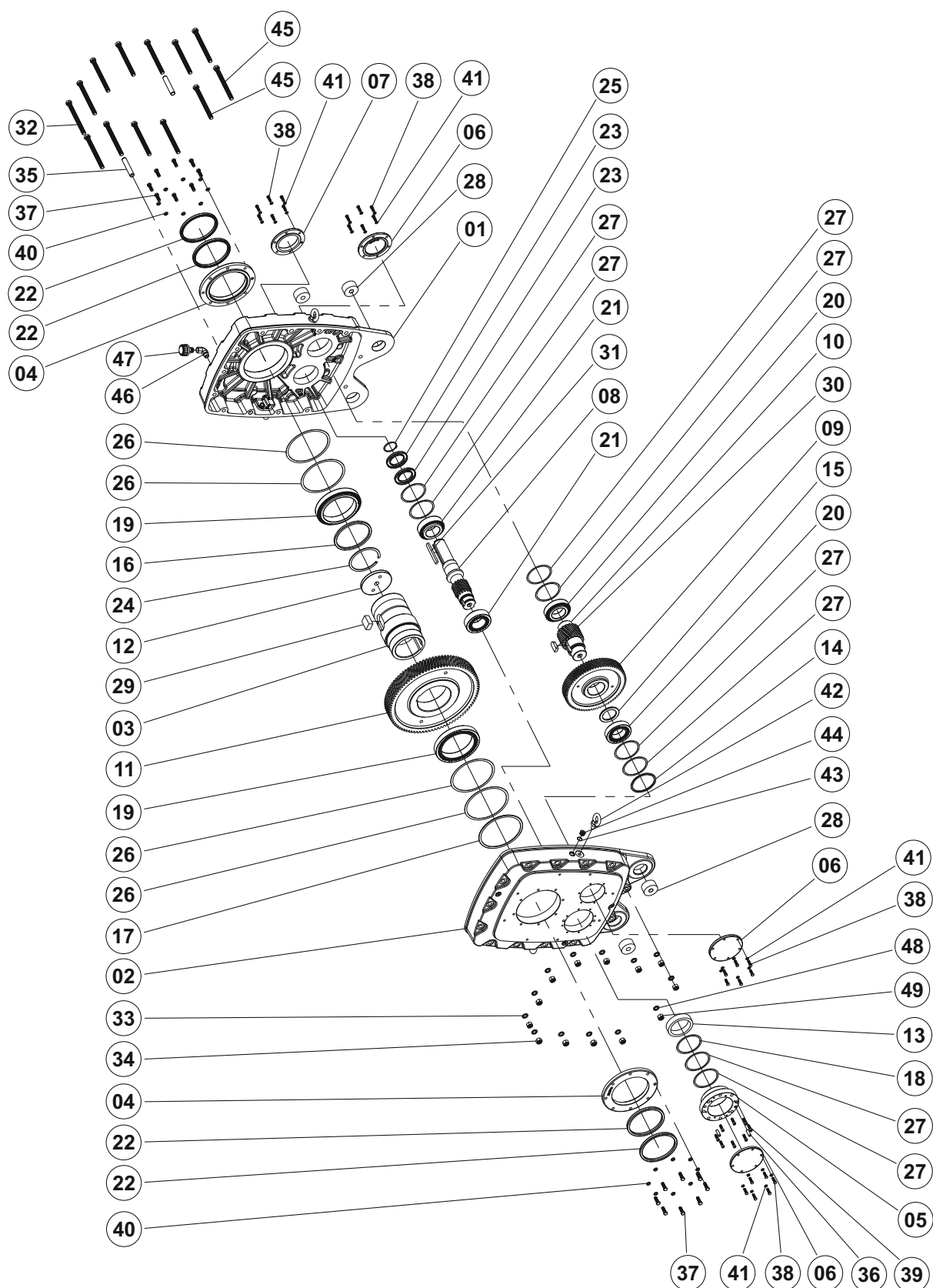
<b>P9</b>	
01	P9 Case A
02	P9 Case B
03	Output Shaft
04	Case Cover
05	Z1 Pinion
06	Z2 Pinion
07	Z3 Pinion
08	Z4 Pinion
09	Socket Head Screw
12	Bearing
13	Bearing
15	Lubricating Seal
16	Lubricating Seal
17	Locking Cap
18	Circlip (DIN 472)
20	Circlip (DIN 471)
22	Shim
23	Key B
24	Key A
25	Key AB
26	Bolt (DIN 933)
27	Spring Washer
28	Jacking Nut (DIN 934)
29	Centering Pin
30	Bolt (DIN 912)
31	Extension Plug
32	Plug Washer
33	Vent Plug
34	Oil Plug



## 7. ACCESSORIES

### P Series

#### P DOUBLE STAGE



**P10 ... P12**



**P Series**

**P DOUBLE STAGE**

	<b>P10</b>
01	P10 Case A
02	P10 Case B
03	Output Shaft
04	Shaft Seal Cover
05	Lock External Cage
06	Case Cover
07	Z1 Side Body Cover
08	Z1 Pinion
09	Z2 Pinion
10	Z3 Pinion
11	Z4 Pinion
12	Socket Head Screw
13	Z1 Spacer
14	Z3 Spacer
16	Z4 Spacer
19	Bearing
20	Bearing
21	Bearing
22	Lubricating Seal
23	Lubricating Seal
24	Circlip (DIN 472)
25	Circlip (DIN 471)
29	Key B
30	Key AB
31	Key B
32	Bolt (DIN 933)
33	Spring Washer
34	Jacking Nut (DIN 934)
35	Centering Pin
36	Dowel Pin
37	Bolt (DIN 933)
38	Bolt (DIN 933)
39	Bolt (DIN 912)
40	Spring Washer
41	Spring Washer
43	Plug Washer
44	Oil Plug
45	Bolt (DIN 933)
46	L Extension Plug
47	Vent Plug
48	Spring Washer
49	Jacking Nut (DIN 934)

	<b>P11</b>
01	P11 Case A
02	P11 Case B
03	Output Shaft
04	Shaft Seal Cover
05	Lock External Cage
06	Case Cover
07	Z1 Side Body Cover
08	Z1 Pinion
09	Z2 Pinion
10	Z3 Pinion
11	Z4 Pinion
12	Socket Head Screw
13	Z1 Spacer
15	Z3 Washer
16	Z4 Spacer
19	Bearing
20	Bearing
21	Bearing
22	Lubricating Seal
23	Lubricating Seal
24	Circlip (DIN 472)
27	Shim
28	Rubber Buffer
29	Key B
30	Key B
31	Key AB
32	Bolt (DIN 933)
33	Spring Washer
34	Jacking Nut (DIN 934)
35	Centering Pin
36	Dowel Pin
38	Bolt (DIN 912)
37-38	Bolt (DIN 933)
40-41	Spring Washer
42	Plug
43	Plug Washer
44	Oil Plug
46	L Extension Plug
47	Vent Plug



### P Series

#### **P DOUBLE STAGE**

##### **P12**

- 01 P12 Case A
- 02 P12 Case B
- 03 Output Shaft
- 04 Shaft Seal Cover
- 05 Lock External Cage
- 06 Case Cover
- 07 Z1 Side Body Cover
- 08 Z1 Pinion
- 09 Z2 Pinion
- 10 Z3 Pinion
- 11 Z4 Pinion
- 12 Socket Head Screw
- 13 Z1 Spacer
- 14 Z3 Spacer
- 15 Z3 Spacer
- 16 Z4 Spacer
- 17 Z4 Washer
- 18 Washer
- 19 Bearing
- 20 Bearing
- 21 Bearing
- 22 Lubricating Seal
- 23 Lubricating Seal
- 24 Circlip (DIN 472)
- 25 Circlip (DIN 471)
- 26 Shim
- 27 Shim
- 28 Rubber Buffer
- 29 Key
- 30 Key
- 31 Key
- 32 Bolt (DIN 933)
- 33 Spring Washer
- 34 Jacking Nut (DIN 934)
- 35 Centering Pin
- 36 Dowel Pin
- 37 Bolt (DIN 933)
- 38 Bolt (DIN 933)
- 39 Bolt (DIN 912)
- 40 Spring Washer
- 41 Spring Washer
- 42 Mapa
- 43 Plug Washer
- 44 Oil Plug
- 46 Extension Plug
- 47 Vent Plug



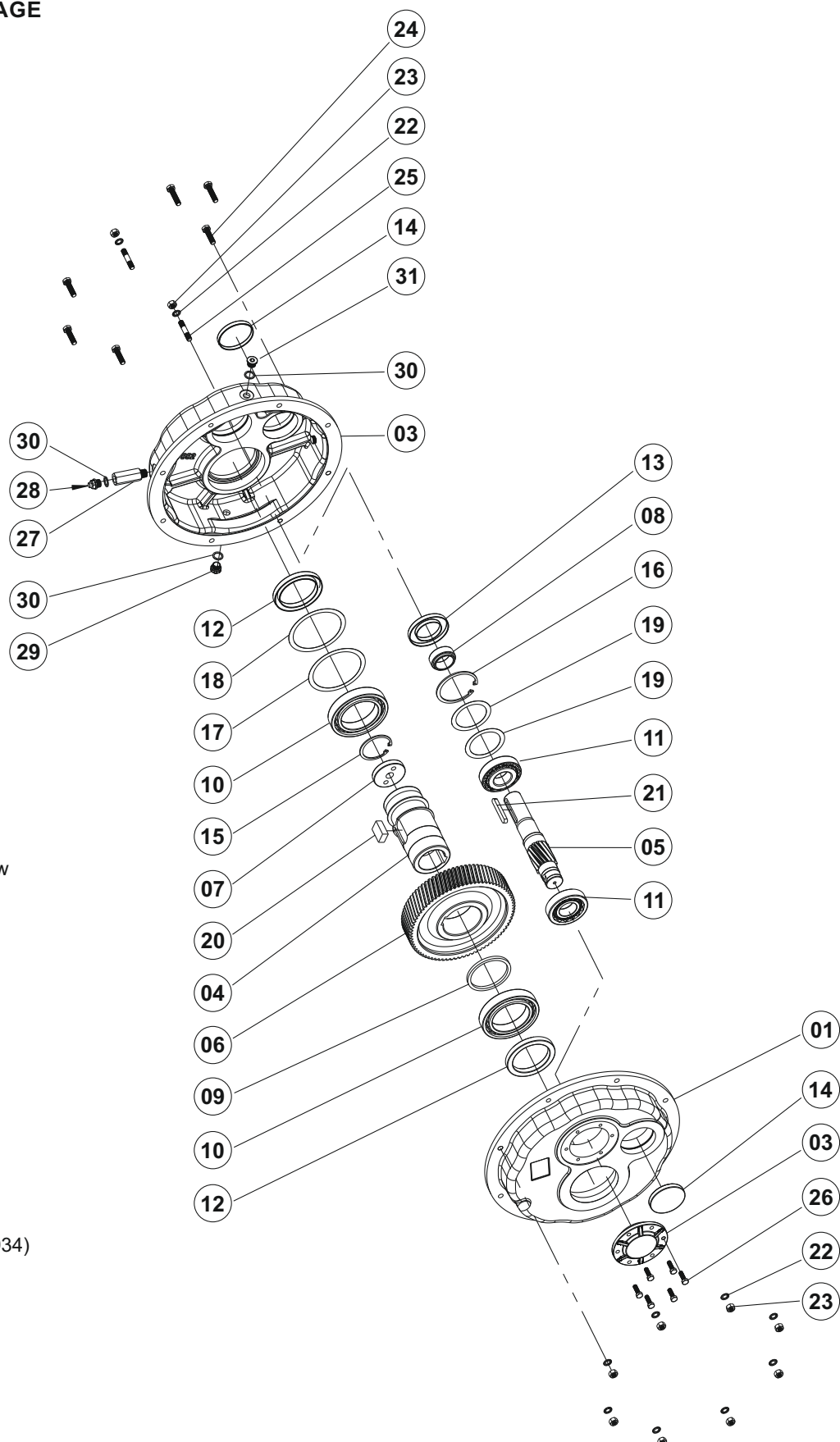


## 7. ACCESSORIES

### Pt/A Series

#### Pt/A 30 SINGLE STAGE

- 01 PTA 50 Case A
- 02 PTA 50 Case B
- 03 Case Cover
- 04 Output Shaft
- 05 Z1 Pinion
- 06 Z2 Pinion
- 07 Socket Head Screw
- 08 Bush
- 09 Washer
- 10 Bearing
- 11 Bearing
- 12 Lubricating Seal
- 13 Lubricating Seal
- 14 Locking Cap
- 15 Circlip (DIN 472)
- 16 Circlip (DIN 472)
- 17 Shim
- 18 Shim
- 19 Shim
- 20 Key
- 21 Key
- 22 Spring Washer
- 23 Jacking Nut (DIN 934)
- 24 Bolt (DIN 933)
- 25 Stud Bolt
- 26 Bolt (DIN 933)
- 27 Extension
- 28 Vent Plug
- 29 Indicator Plug
- 30 Plug Washer
- 31 Oil Plug



**Pt/A 35.....125**



**Pt/A Series**

**Pt/A 30 SINGLE STAGE**

<b>Pt/A SINGLE STAGE</b>									
<b>Material No</b>	<b>Pt/A 35.35</b>	<b>Pt/A 40.40 Pt/A 40.45</b>	<b>Pt/A 45.45 Pt/A 45.50 Pt/A 45.55</b>	<b>Pt/A 50.50 Pt/A 50.55 Pt/A 50.60</b>	<b>Pt/A 60.60 Pt/A 60.70</b>	<b>Pt/A 70.70 Pt/A 70.85</b>	<b>Pt/A 80.80 Pt/A 80.100</b>	<b>Pt/A 100.100 Pt/A 100.125</b>	<b>Pt/A 125.125 Pt/A 125.135</b>
<b>5</b>	30/52/7	35/62/7	40/72/7	55/90/10	52/72/8	60/80/8	55/90/10	65/90/10	70/110/12
<b>6</b>	50/72/8	60/85/8	75/100/10	85/110/12	100/130/12	120/150/12	140/180/12	160/190/15	170/200/15
<b>7</b>	6010	6012	6015	6017	6020	6024	6028	6032	6034
<b>8</b>	6304	30305	30306	30308	NJ 2209 E	NJ 2210 E	NJ 2211 E	NJ 313 E	NJ 314 E
<b>9</b>	6205	30305	30306	30308	NJ 2209 E	NJ 2211 E	NJ 2211 E	NJ 314 E	NJ 314 E

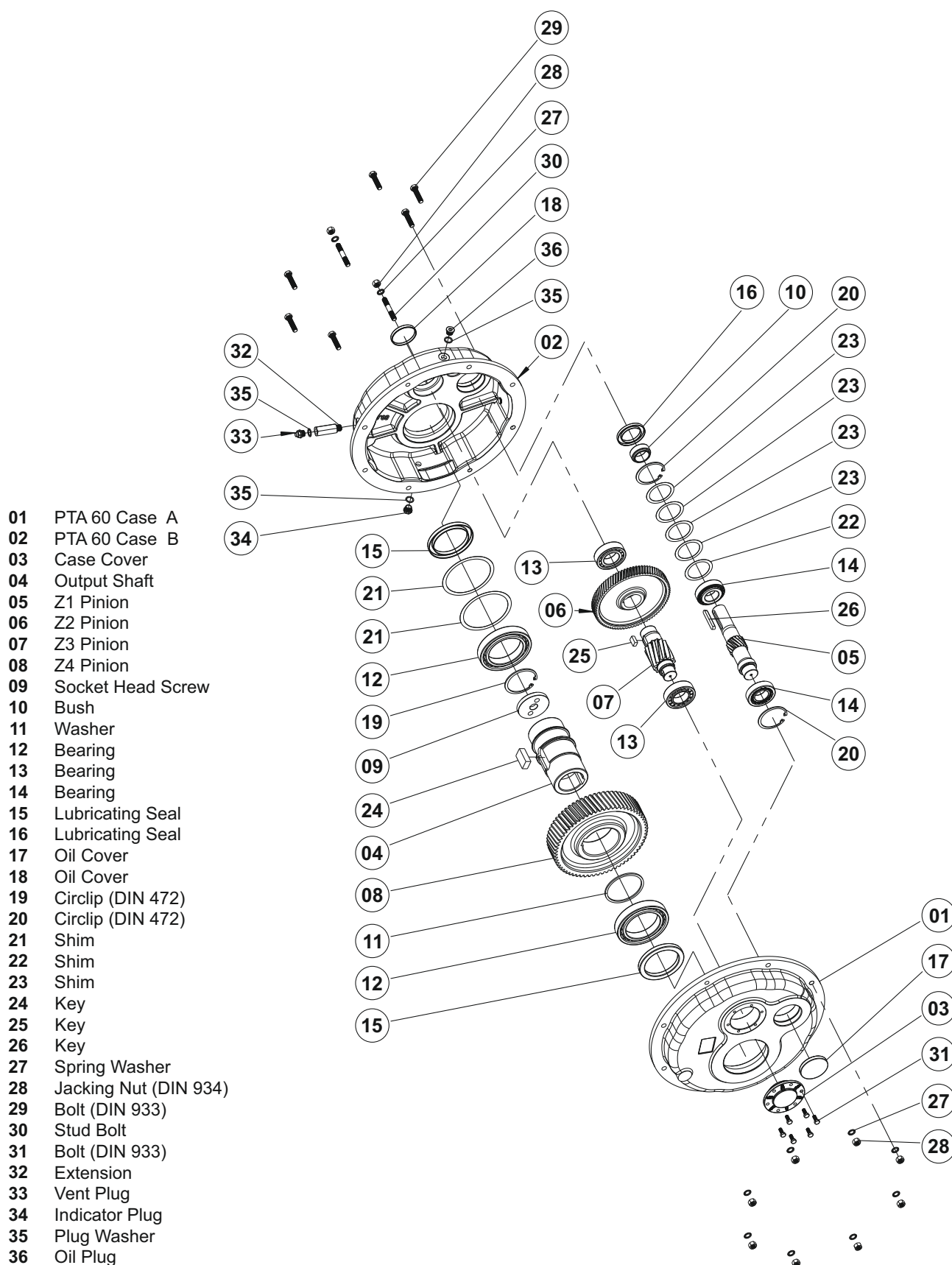
- 01** Case A
- 02** Case B
- 03** Case Cover
- 04** Oil Cover
- 05** Oil Seal
- 06** Oil Seal
- 07** Bearing
- 08** Bearing
- 09** Bearing
- 10** Output Shaft
- 11** Z1 Pinion
- 12** Z2 Pinion
- 13** Key
- 14** Key
- 15** Circlip
- 16** Circlip
- 17** Washer
- 18** Fixing Element
- 19** Bush
- 20** Apparatus for Extension
- 21** Vent Plug
- 22** Oil Level Plug
- 23** Oil Plug
- 24** Hexagonal Head Screw
- 25** Tab Washer
- 26** Jacking Nut (DIN 934)
- 27** Stud Bolt
- 28** Bolt
- 29** Bracket



## 7. ACCESSORIES

### Pt/A Series

#### Pt/A DOUBLE STAGE



Pt/A 35.....125





**Pt/A Series**

**Pt/A DOUBLE STAGE**

<b>Pt/A DOUBLE STAGE</b>									
Material No	Pt/A 35.35_D	Pt/A 40.40_D Pt/A 40.45_D	Pt/A 45.45_D Pt/A 45.50_D Pt/A 45.55_D	Pt/A 50.50_D Pt/A 50.55_D Pt/A 50.60_D	Pt/A 60.60_D Pt/A 60.70_D	Pt/A 70.70_D Pt/A 70.85_D	Pt/A 80.80_D Pt/A 80.100_D	Pt/A 100.100_D Pt/A 100.125_D	Pt/A 125.125_D Pt/A 125.135_D
6	30/52/7	35/52/7	40/62/7	55/80/10	55/80/8	55/85/10	60/90/8	70/120/10	75/110/12
7	50/72/8	60/85/8	75/100/10	85/110/12	100/130/12	120/150/12	140/180/12	160/190/15	170/200/15
8	6010	6012	6015	6017	6020	6024	6028	6032	6034
9	6304	6305	6306	NJ 308 E	NJ 2209 E	NJ 2210 E	NJ 2211 E	NJ 313 E	NJ 314 E
10	6304	30205	30206	32208	32208	32209	32210	30311 - 32213	32212
11	6205	NJ 305 E	NJ 306 E	NJ 308 E	NJ 2209 E	NJ 211 E	NJ 2211 E	NJ 314 E	NJ 314 E

- 01 Case A
- 02 Case B
- 03 Case Cover
- 04 Oil Cover
- 05 Oil Cover
- 06 Seal
- 07 Seal
- 08 Bearing
- 09 Bearing
- 10 Bearing
- 11 Bearing
- 12 Output Shaft
- 13 Z2 Pinion
- 14 Z3 Pinion
- 15 Z1 Pinion
- 16 Z4 Pinion
- 17 Key
- 18 Key
- 19 Key
- 20 Circlip
- 21 Circlip
- 22 Circlip
- 23 Circlip
- 24 Washer
- 25 Washer
- 26 Fixing Element
- 27 Bush
- 28 Apparatus for Extension
- 29 Vent Plug
- 30 Oil Level Plug
- 31 Oil Plug
- 32 Hexagonal Head Screw
- 33 Spring Washer
- 34 Jacking Nut (DIN 934)
- 35 Stud Bolt
- 36 Bolt
- 37 Bracket



### 8.1 Product Disposal

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

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

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

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

#### 8.1.1 Disposal

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

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



#### 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.



### 8.2 Sorun Giderme

NO	PROBLEM	OBSERVED	SOLUTION
①	Gearbox does not work.	The noise is not coming from gearbox. Output shaft of the gearbox is not rotating. Driver / frequency inverter is not be used.	Check the connection of electric motor, voltage and frequency. The values could be same with the values which are on the motor label. Look at to the motor usage guide. If the solution is not found look to the article 50.
②	Gearbox does not work.	The noise is not coming from gearbox. Output shaft of the gearbox is not rotating. Driver / frequency inverter is used.	Look to the guide of driver / frequency inverter or driver usage guide. Determine that error is not originated from driver / frequency inverter by seperating electric motor either from driver and frequency inverter and making direct connection to the motor.
③	Gearbox does not work.	A different noise is coming out of the gearbox. But gearbox and motor shaft are not rotating. Driver / frequency inverter or magnetic brake are not used.	The first thing that has to be made is to check whether motor connection, voltage and frequency are identical with motor label values. If there is not any problem, to pull out gearbox from the machine and try to operate in neutral. If gearbox works, the power of motor may not be enough to operate system. If the motor which connected to the gearbox is monophase, take off capacitors should be controlled. Even the motor does not work despite all tests and examinations, look at to the article 50.
④	Gearbox does not work.	A different noise is coming out of the gearbox. But gearbox and motor shaft are not rotating. Driver / frequency inverter or magnetic brake are used.	The frequency inverter or driver usage guide should be examined. Determine that error is originated whether from driver / frequency inverter by seperating electric motor either from driver and frequency inverter and making direct connection to the motor. If the gearbox does not work, look at to the article 50.
⑤	Gearbox does not work.	A different noise is coming out of the gearbox. But gearbox and motor shaft are not rotating. Magnetic brake is used.	It is necessary to check whether electric motor connection, voltage and frequency are identical with motor label values. Look at to the motor usage guide. Be sure that brake is working. If the brake is assembled by us to check whether it is made correctly according to the schema at the usage and maintenance instructions. If the error is not found to check whether the brake is operating by making direct connection to the brake appropriate to the brake voltage. When the electric is given, the noise of the opening of brake will come. If the brake is not working even by giving electric, the diode of brake could be in failure. To feed the motor directly according to the informations on the label when the brake is seperated from disc. If the problem is continuing, the power of the motor may not be enough. Look to the article 50.
⑥	Gearbox does not work at low speeds / frequencies.	Use driver / frequency inverter.	The motor feeding frequency is declining at low speeds. For the operating of motor at very low frequencies, it is essential to adjust motor parameters and frequency inverter parameters very well. Besides for the low speeds, there could be big changes even at the gearbox efficiency. To enlarge motor power and inverter or for to reach your requested cycle range, change the gearbox ratio.



## 8. TROUBLESHOOTING

NO	PROBLEM	OBSERVED	SOLUTION
7	Gearbox does not work after long awaitings or at mornings.	Environmental temperatures are dropping below -5°C.	The gearbox oil is not suitable to the environmental temperatures where it works. It is necessary to use low viscosity oils or to protect gearbox group from cold. To find proper oil look to usage guide or examine lubricating pages from the product catalogs. To work at higher environmental temperatures could be a solution. If the problem is continuing, the motor power should be increased.
8	Gearbox is very heating up.	You use worm screw type gearbox and environmental temperature is under +40°C.	When the gearbox is working under the full load, gauge gearbox surface temperature with heat meter. If it is under +90°C it is normal and no harm to gearbox. All worm screw and ATEX compatible helical gearboxes could be used up to the +120°C surface temperatures. If the temperature is above the +120°C and gearbox is ATEX compatible immediately stop gearbox and inform to PGR. Look to the article 50. If it is the product without ATEX, to check the oil amount according to the mountage position. Be sure that the mounting position written on the label and mounting position which gearbox is working should be identical. If not look to the article 50. To the gearboxes without worm screw types at heatings above +80°C, look to the articles 9 and 50.
9	Gearbox is very heating up.	You use helical gearboxes and environmental temperature is under +40°C.	When the gearbox is working under the full load, gauge gearbox surface temperature with heat meter. If it is under +90°C it is normal and no harm to the gearbox. All gearboxes with ATEX are designed to work at maximum +120°C. If the temperature is above +120°C and gearbox is ATEX compatible immediately stop gearbox and inform to PGR. The gearboxes without ATEX are designed to work at maximum +90°C temperature values. If the gearbox temperature is above the +90°C, control the oil amount according to mounting position. Be sure that the mounting position written on the label and mounting position which gearbox is working should be identical. If there is inconsistency look to the article 50.
10	Gearbox is very heating up.	Environmental temperature is above +40°C.	The standard gearboxes are designed to work at maximum +40°C. Temperatures above +40°C, special applications and additions should be done. In these situations please consult to PGR.
11	Gearbox is working noisy.	Noise is regular and perpetual.	Control the mobile machine elements. Operate gearbox without load by separating from the system. If you hear the same noise, bearings which belong to gearbox or motor could be in failure. Look to the article 50.
12	Gearbox is working noisy.	Noise is irregular.	Control the mobile machine elements. Operate gearbox without load by separating from the system. If the same noise is continuing, foreign objects could be in the oil. Change the oil and control the foreign objects in the oil. If the metal piece is found into the controlled oil, the gearbox could be damaged. Look to the article 50.



NO	PROBLEM	OBSERVED	SOLUTION
13	Gearbox is working noisy.	Noise is regular with clicking.	Control the mobile machine elements. Operate gearbox without load by separating from the system. If the same noise is continuing, gearbox parts could be damaged. Look to the article 50.
14	Gearbox is working noisy.	Noise is regular and fluctuating.	Control the flexure of connection elements which connect to output shaft. Separate element which is connected to output shaft and operate gearbox without load. If the same noise is continuing, look to the article 50.
15	Gearbox is working noisy.	Gearbox has motor with brake and noise is coming from the brake side.	The noises could be coming from the brake like in the shape of low level randomly tickings and it is normal. If the noise level is disturbing, brake could be damaged or there may be a problem at the gap adjustment between lining and disc. Look to the article 50.
16	Gearbox is working noisy.	You use frequency inverter and the noise is changing every time by the change of cycle.	Frequency inverter parameters may not be compatible with your used motor. Examine frequency inverter usage guide and if the same problem is continuing look to the article 50.
17	Oil leakage is existing.	Oil leakage from the seal.	If the environmental temperature is above +40°C and there is continuous working over 16 hours, according to the mounting position pull out a plug which is on the top and use ventilation plug instead of it. If your situation is not suited to this, seal could be damaged. Look to the article 50.
18	Oil leakage is existing.	Oil is leaking from the plug.	If you use the ventilation plug, be sure that the plug is at the right position. According to the mounting position of the gearbox, plug which is on the top could be ventilation plug. The plug may loosen, clean the surface and plug itself and squeeze it again. If the same problem is continuing, look to the article 50.
19	Oil leakage is existing.	Oil is coming out of the the housing.	To observe where the oil is exactly coming from. It is leaking from the oil plug, oil cover or seal and could flow onto the housing. If the situation is like this, look to the article 18 and 19. If you sure that oil is coming out of the housing there could be cracks and fractures at the housing. Look to the article 50.
20	Oil leakage is existing.	Oil is coming out of the the cover.	A gasket that is used between cover and housing is not performing its leaktightness duty. Dismantle the cover clean the bottom side and assemble cover to its place by smearing liquid gasket. If the problem continues look to the article 50.
21	Gearbox is making regular vibrations when it is worked at the assemble point.	You use torc arm.	The reason of the vibration of gearbox is originated from the shaft flexure which gearbox is connected. When the torc arm is used, it has no harm to gearbox and it is usual situation.



## 8. TROUBLESHOOTING

NO	PROBLEM	OBSERVED	SOLUTION
(22)	Gearbox is making random vibrations when it is worked at the assemble point.	You use torc arm.	The reason of the vibration of gearbox is because of shaft flexure which the gearbox is connected and passing gap between shaft and bushing. Control your shaft hole passing tolerance. When the torc arm is used, it has no harm to gearbox and it is usual situation.
(23)	Motor is warming a lot.	Motor is working above its normal ampere. Environment is clear.	There could be overloading or motor power is insufficient. Motor could be in failure. Look to the article 50.
(24)	Motor is warming a lot.	Environment is dusty.	Be sure of whether motor fan bowl and motor cooler cores are clean for the air passing. If you use extra fan be sure that it is working. If there is invertor usage at the motor and works at low frequencies, the motor fan may not be sufficient. Use extra fan in these situations. If the problem continues look to the article 50.
(25)	Motor shaft is rotating but gearbox shaft is not.	Friction noise is coming from inside of gearbox or only there is motor noise.	There could be a damage at the gearbox parts. Look to the article 50.
(26)	Motor shaft is rotating but gearbox shaft is not.	You use chain geared or pinion geared at the output shaft of gearbox.	The damage could be originated of polygon impact formed by chain geared or from the radial load. Gearbox connection points may not be rigid enough. Be sure that you are able to use proper chain geared and pinion geared for used gearbox. Recalculate maximum allowable radial load according to this position. Look to the article 50.
(27)	Output shaft is cut.	You use either chain geared or pinion geared.	The damage could be originated of polygon impact formed by chain geared or from the radial load. Gearbox connection points may not be rigid enough. Be sure that you are able to use proper chain geared and pinion geared for used gearbox. Recalculate maximum allowable radial load according to this position. Look to the article 50.
(28)	Gearbox is stopping too late.	You use motor with brake	Control the electric connection schema of brake. Be sure that there is not assembled delayed diode onto the brake. If there is delayed diode, it could be changed. ( Hoisting gearboxes are excluded PCS)
(50)	Service is required.	Informing of PGR Company.	Please contact with PGR company. Communication informations are given at the usage guides,catalogs. Mechanical parts can only be changed either by PGR or within the knowledge. Any change that is to be made without the knowledge of PGR would cancel both guarantee of product and all certificate decelerations and remove the responsibilities of PGR over the product.

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



### 9.1 Authorized Service

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

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



## 10. WARRANTY

### 10.1 CE Document

#### P Series



**POLAT GROUP REDÜKTÖR SAN. ve TİC.A.Ş.**  
Ata Mahallesi Astım Org. San. Böl. 1.Cd No:4  
Efeler Aydın /TURKEY  
Tel: 0090 256 231 19 12 Fax: 0090 256 231 19 17  
e-mail: [info@pgr.com.tr](mailto:info@pgr.com.tr) web: [www.pgr.com.tr](http://www.pgr.com.tr)

#### **MANUFACTURER'S DECLARATION**

**In accordance to the EC-Machinery Directive 2006/42/EC, Annex IIB**

are manufactured, tested and verified in conformity with the **European Directive ATEX 2014/34/EU** and that are suitable for installation in potentially explosive atmosphere, within the limits of classified areas, providing that declared performance use/installation instructions are respected.

**We declare on our own responsibility that the following products,**

#### **Shaft Mounted Speed Reducer**

**Type: P**

**Case width:**      **P1 ... P8      ratio 5/1   13/1   20/1**  
                         **P1 ... P12      ratio 13/1   20/1**

**which this declaration refers to be incorporated into machinery or assembled with other machinery covered by the Machinery Directive is in conformity with the following standards**

**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**

**July 11, 2016**  
**Date**

**The products mentioned in this declaration should not be put into service, until the machinery has no conformity of the provisions of the relevant European Directives.**

**Authorized Person**  
**Necdet DEMİR**  
**General Manager**

**This declaration is not a guarantee of characteristics in the sense of the product liability law. The safety regulations of the user manual have to be observed.**



**Pt/A Series**

**POLAT GROUP REDÜKTÖR SAN. ve TİC.A.Ş.**  
Ata Mahallesi Astım Org. San. Böl. 1.Cd No:4  
Efeler Aydın /TURKEY  
Tel: 0090 256 231 19 12 Fax: 0090 256 231 19 17  
e-mail: [info@pgr.com.tr](mailto:info@pgr.com.tr) web: [www.pgr.com.tr](http://www.pgr.com.tr)

**MANUFACTURER'S DECLARATION**

**In accordance to the EC-Machinery Directive 2006/42/EC, Annex IIB**

are manufactured, tested and verified in conformity with the **European Directive ATEX 2014/34/EU** and that are suitable for installation in potentially explosive atmosphere, within the limits of classified areas, providing that declared performance use/installation instructions are respected.

**We declare on our own responsibility that the following products,**

**Helical Gear, Shaft Mounted Speed Reducer**

**Type: Pt/A**

**Case width: Pt/A 30,35,40,45,50,60,70,80,100,125 ratio single stage sizes**  
**Pt/A 35,40,45,50,60,70,80,100,125 ratio double stage sizes**

**which this declaration refers to be incorporated into machinery or assembled with other machinery covered by the Machinery Directive is in conformity with the following standards**

**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**

**July 11, 2016**  
**Date**

**The products mentioned in this declaration should not be put into service, until the machinery has no conformity of the provisions of the relevant European Directives.**



**Authorized Person**  
**Necdet DEMİR**  
**General Manager**

**This declaration is not a guarantee of characteristics in the sense of the product liability law. The safety regulations of the user manual have to be observed.**



## 10. WARRANTY

### 10.2 ATEX Document



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*ATEX 2014/34/AB YÖNETMELİĞİ*

**TEKNİK DOSYA ALINDI SERTİFİKASI**

[1]

[2] ATEX 2014/34/AB Yönetmeliği'nin 15.1 b (2) maddesine göre teknik dokümantasyon tarafımızca alınıp, muhafaza edilmiştir.

[3] Alındı Belgesi Numarası: SCA18TDEX006

[4] Teknik Dosya Numarası: PGRATEX18 / Rev.00

[5] Teknik Dosya Tarihi: 22.03.2018

[6] Ekipman veya Koruyucu Sistem: REDÜKTÖR DİŞLİ VE DİŞLİ KUTUSU  
Modeller: P,PA,PF,PD,PM,PKD,PSH,P1A,PMRV,PMRV Plus,A,F,D,M,K,PL,PLB,PH,PB,PYK,PRC/PRCF,PEX,PCS

[7] Üretici Firma: POLAT GROUP REDÜKTÖR SAN. VE TİC. A.Ş.

[8] Firma Adresi : ATA MAH. ASTİM. OSB 1. CADDE , NO:4 EFELER-AYDIN/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.


[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 tedarikine ilişkin yönetmeliğin diğer hükümleri saklıdır.

[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.

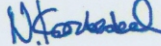
[12] Bu alındı belgesi sadece bütünüyle ve değişiklik yapılmadan çoğaltılabilir.

[13] Referans standartlar:  
EN ISO 80079-36:2016 , EN ISO 80079-37:2016

[14] Üreticinin beyanına göre ekipman veya koruyucu sistemin etiket tanımı :





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



ONAY  
**Necdet KARABAKAL**  
SCA Teknik Müdürü


Onay Tarihi : 26.03.2018





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NB 2336

SCA Belgelendirme ve Özel Eğitim Hizmetleri Ltd. Şti.  
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Phone: 0090- 232 - 489 02 12 Fax: 0090 - 489 02 17  
www.scaatex.com e-mail: info@scaatex.com



EXPLOSIVE ATMOSPHERES  
**SCA**  
NB 2336  
PATLAYICI ORTAM

FR 32/17.01.2018/03

1/1

**MANUFACTURER AND SERVICE STATION ADDRESS: (Factory)**

ATA MAH. ASTİM ORGANİZE SAN. BÖL. 1.CAD. NO: 4 Efeler / AYDIN / TURKEY

Tel : +90 256 231 19 12 - 16 Pbx  
Fax : +90 256 231 19 17  
Web : [www.pgr.com.tr](http://www.pgr.com.tr)  
e-mail : [info@pgr.com.tr](mailto:info@pgr.com.tr) - [satissonrasi@pgr.com.tr](mailto:satissonrasi@pgr.com.tr)

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**AREAS****ANKARA AREA**

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Ostim / ANKARA

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Fax : +90 312 385 79 27  
e-mail : [ankara@pgr.com.tr](mailto:ankara@pgr.com.tr)

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**İSTANBUL AREA**

İKİTELLİ O.S.B. METAL-İŞ SANAYİ SİT. 9.BLOK NO: 23  
Başakşehir / İSTANBUL

Tel : +90 212 549 80 55  
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**ALMANYA AREA**

IN DER SCHLINGE 6, D-59227  
Ahlen / GERMANY

Tel : 0049 / 23828557010-7011-7012-7016  
Web : [www.nrwdrivetechologies.com](http://www.nrwdrivetechologies.com)  
e-mail : [info@nrwdrivetechologies.com](mailto:info@nrwdrivetechologies.com)

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