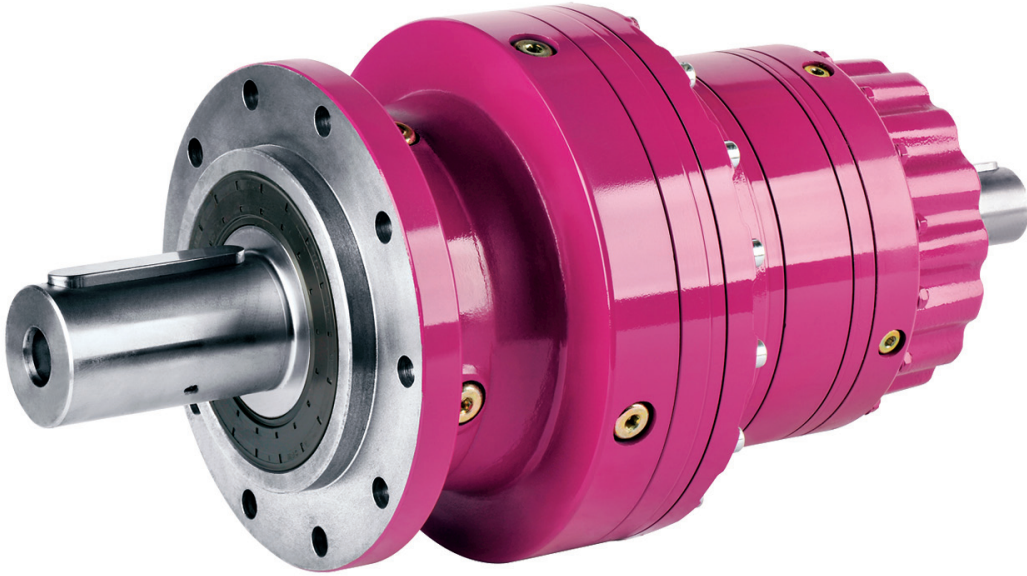




P Series Gear Units

OIPEX0500/0612

Operating Instructions



Contents.....	02
1 - How to Use This Manual	05
2 - Unit Designation	06
2.1- Detailed Unit Designation	06
2.2- Nameplate, Unit Designation	07
3. Standard Type Gearbox Parts Lists	08
3.1- Output Group.....	08
3.1.1- R,01,1K,1L,11..35	08
3.1.2- P,01,1K,1L,11..24	09
3.1.3- P,0S,0K,0L,11..24	10
3.1.4- P,01,1K,1L,27..35	11
3.1.5- P,S0,27..35	12
3.1.6- P,0K,0L,27..35	13
3.1.7- P,0S,29..35	14
3.2- Gear Group	15
3.2.1- P,R,11..15	15
3.2.2- P,R,12..35	16
3.2.3- P,R,11..35 (Bevel Stage)	17
3.3- Input Group.....	18
3.3.1- P,R,11..15 (IEC B5)	18
3.3.2- P,R,11..35 (C26,M46)	19
3.3.3- P,R,11..35 (Solid Shaft)	20
4- Things to Check Before the Gear Unit or Geared Motor is Installed	21
4.1- Safety notes for use in potentially explosive atmosphere	21
Intended use of Gearbox	21
4.2- Transportation	22
4.3- Storage.....	22
4.4.1- Lifting positions for P types.....	23
4.4.3- Lifting positions for R types.....	26
4.4.5- Lifting positions for P series combined with E series.....	28
4.4.6- Lifting positions for R series combined with E series.....	29



5 - Installing the Gear Unit	30
5.1- Before You Start	30
5.2- Check Name Plate of the Gear Unit	30
5.3- Check the Ambient Conditions and Temperature	30
5.4- Check Fitting Elements and the Shaft Dimensions to Fit	30
5.5- Check the Voltage Supply	32
5.6- Check the Mounting Position.....	32
5.7- Usage of Breather Plug	32
5.8- Check the oil level	33
5.9- Check shaft ends and mounting faces	33
5.10- Cover abrasive ambients.....	33
5.11- Check accessibility to filling, breather and drain plugs	33
6- Mechanical Installation	34
6.1- Installing gear units in category II2G/D-II3G/D	34
6.2- Installing Customer Shaft with Shrink Disk.....	35
6.3- Disassembling Customer Shaft with Shrink Disk	37
6.4- Assembling Gear Unit with Torque Arm	38
6.5- Fitting Output Shaft Elements	40
6.6- Correct Position of Output Shaft Elements.....	40
6.7- Correct Position of Splined Output Shaft.....	40
6.8- Fitting Couplings.....	41
7- Maintenance and Inspections	42
8- Lubrication	43
8.1- Oil types	43
8.2- Changing the oil	44
8.3- Mounting Positions	44
8.4- Oil Quantities.....	49
8.5- Oil Plugs	53
8.6- Oil Expansion Tanks.....	59



9- Troubleshooting Guide.....	60
10- Appendix.....	
10.1- Warranty Conditions.....	
10.2- Warranty Declaration.....	
10.3- Service Contact Points.....	



1 - How to Use This Manual

Take attention to the following safety and warning signs for proper understanding and quick reference.



Electrical Hazard; Can cause severe or fatal injuries.



Mechanical Hazard; Can cause severe or fatal injuries.



Likely to be Hazardous; Can cause minor or fatal injuries



Damage Risk; Can damage the gearbox or environment



Important Information



Important information about explosion protection

The operating instructions contain important information to ensure ;

- Trouble-free operation
- Fulfilment of any rights to claim under guarantee

The operating instruction must be kept close to the gearbox and must be available in case it is needed.

This operating instruction is written for P series gear units and is applicable only for these series. If any different type of gear unit is used please ask YILMAZ REDUKTOR. For special application and modified gear units ask YILMAZ REDUKTOR for validity.

The P series gear units are with standard IEC B5/B14 connection flange or with input shaft and without motor. The electric motor which will be connected to the gear unit must also be in conformity with the ATEX (94/9/EC) standards.

All the external parts which will be assembled to the gear unit must conform ATEX (94/9/EC). The product this declaration refers to must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the relevant European Directives.

If the gear unit is not operated as informed on this manual the gear unit is no longer ATEX conforming and YILMAZ REDUKTOR does not take any responsibility.



2 - Unit Designation

2.1- Detailed Unit Designation

Detailed P Series gear units designation for ordering (This Designation is different from the short nameplate designation)

P N 11 0 2 L . 01 - Additional Information



Output Shaft Properties:

- 01.....Solid Output Shaft
- 0K.....Splined Hollow Shaft DIN 5480
- 0L.....Splined Hollow Shaft DIN 5482
- 0S.....Shrink Disc
- 1K.....Splined Solid Shaft DIN 5480
- 1L.....Splined Solid Shaft DIN 5482

Optional for P24:

- 10.....Solid Output Shaft
- K0.....Splined Hollow Shaft DIN 5480
- L0.....Splined Hollow Shaft DIN 5482
- S0.....Shrink Disc
- K1.....Splined Solid Shaft DIN 5480
- L1.....Splined Solid Shaft DIN 5482

Shaft Condition:

- L: Input and Output Shafts on Same Axis
- K: Input and Output Shafts Perpendicular

Number of Stage:

- 1.....Single Stage
- 2.....Two Stage
- 3.....Three Stages
- 4.....Four Stages

Revision Number

Gearbox Sizes:

11,12, 15, 16, 19, 23, 24, 27, 29, 35

Version of Gearbox:

- V.....With Electric or Hydraulic Motor
- N.....Motor Connection Flange (IEC, C26, M46)
- T.....Solid Input Shaft

Serie of Gearbox:

- P.....Planetary Gearbox with Flange Mounted.
- R.....Planetary Gearbox with Foot Mounted.

Additional Information: (For PN, PV, RN, RV)

- If the gearbox unit is PN, RN Type:

- A06 63 size IEC B5 motor connection flange
- A07 71 size IEC B5 motor connection flange
- A08 80 size IEC B5 motor connection flange
- A09 90 size IEC B5 motor connection flange
- A10 100 / 112 size IEC B5 motor connection flange
- A13 132 size IEC B5 motor connection flange
- A16 160 size IEC B5 motor connection flange
- A18 180 size IEC B5 motor connection flange
- A20 200 size IEC B5 motor connection flange
- A22 225 size IEC B5 motor connection flange
- A25 250 size IEC B5 motor connection flange
- C26 Flange code C, Shaft code 26 (HE Hydraulic Motor)
- M46 Flange code M, Shaft code 46 (HG Hydraulic Motor)

- If PN, RN type gearbox unit connected with hydraulic motor:

- HE330
 - Geometric displacement
 - Hydraulic motor type (HG or HE)

- If the gearbox unit is PV, RV type:

- 90S/4
 - Number of pole
 - Frame length
 - Motor size (63...-250...)

- If PN, RN type gearbox unit coupled with a worm gearbox:

- EV063-71/4b
 - Iron core length
 - Number of pole
 - Motor size (63...-132...)
 - Size of worm gearbox (63-125)
 - Worm gearbox type
 - EV: With motor
 - EN: With motor flange
 - ET: Without motor

Examples

PT1202K.01

Without motor, solid output shaft, gearbox size 12, 2 stages, perpendicular input and output shaft with flange

PV1902L.01-160M/6

Motor with 11 kW 900 rpm, solid output shaft, gearbox size 19, 2 stages, parallel input and output shaft with flange

RV1502L.00-90S/6

Motor with 0,75 kW 900 rpm, hollow output shaft, gearbox size 15, 2 stages, parallel input and output shaft, with foot

PN1102L.01-EV063-71/4b

Motor with 0,37 kW 1400 rpm, connected with worm gearbox size 63, solid output shaft, 2 stages, parallel input output shaft, planetary gearbox size 11 with flange



2.2- Nameplate, unit designation



Nameplate unit designation is a short abbreviation from the detailed designation

A sample name plate for P Series according to 94/9/EC

 YILMAZ REDÜKTÖR A.S. ATATÜRK Mah. Lozan Cad. No:17 P.K.34522 Esenyurt-İstanbul- TÜRKİYE	
Type: PN1102L.01 / 2GD	
S/N. : 100478985 IP65	
P : 11 kW	M ₂ : 1000 Nm.
n ₁ : 1400 rpm.	n ₂ : 85 rpm.
F _{R2} : 12500 N	F _{R1} : 500 N
F _{A2} : 7500 N	F _{A1} : 235 N
Oil : SYNTHETIC VG320	Qty: 2.1 lt.
M.Pos.: M1	T _a : -20/+40 °C
 II 2GD IIB c k T3 / T180 °C	

Abbreviations:

Type. : Type of gearbox

S/N: Serial Number of gear unit (Production Date can be learnt from YILMAZ with this number.)

IP...: Enclosure

P : Max. Allowed Power

M₂: Output torque

n₁: Input speed

n₂: Output speed

FR₂: Max. allowed radial load at output shaft

FR₁: Max. allowed radial load at input shaft

FA₂: Max. allowed axial load at output shaft

FA₁: Max. allowed axial load at input shaft

Oil : Filled oil inside the gear unit

Qty. : Oil quantity

M.pos.: Mounting Position.

T_a : Ambient Temp.

Category of Gear Unit (in acc. to 94/9/EC)	Intended use in Zones (in acc. of 1999/92/EC)
2GD	1; 21; 2; 22
3GD	2; 22



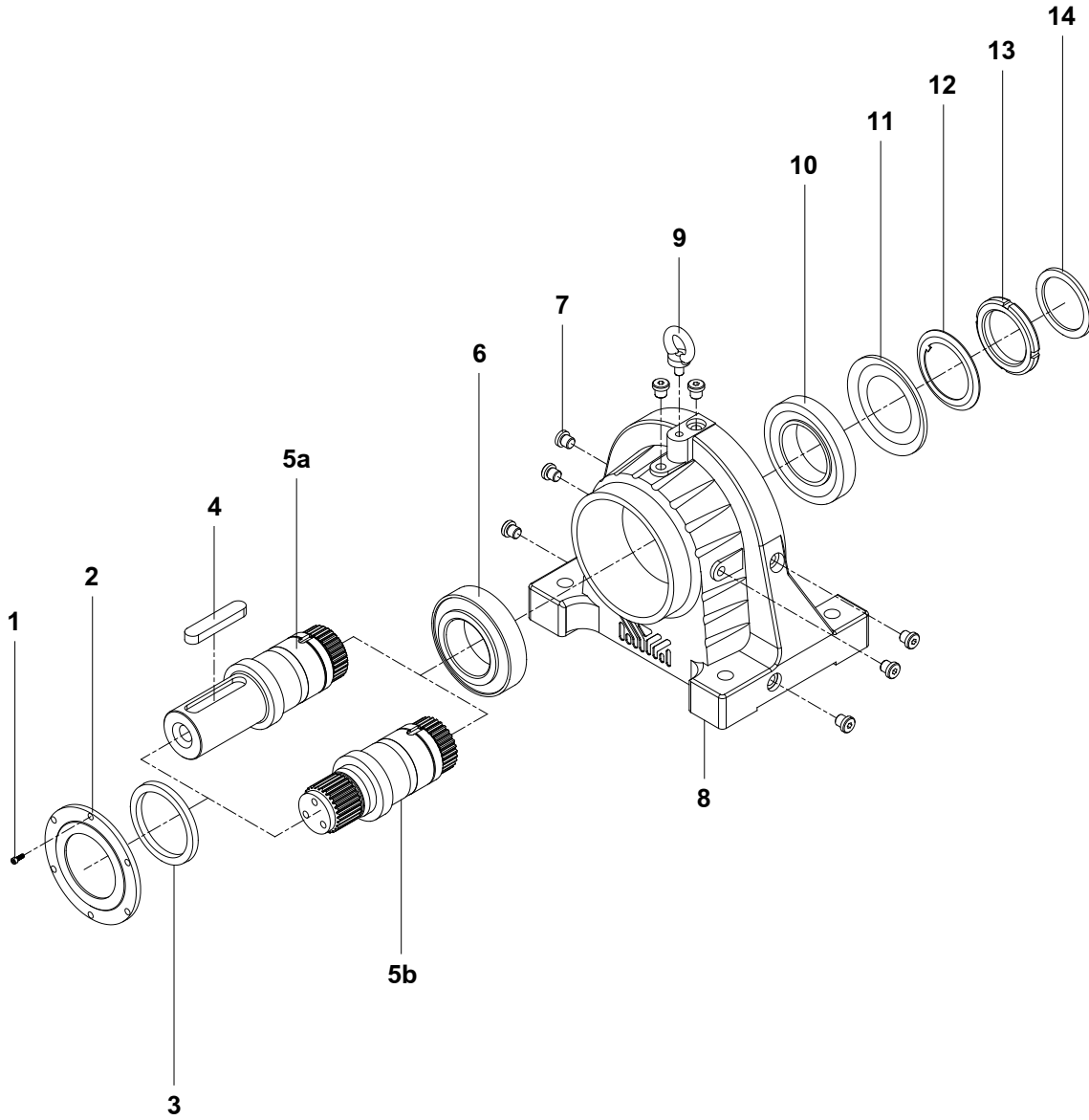
3. Standard Type Gearbox Part List

3.1- Output Group

3.1-1 Version of Gearbox : RV / RN / RT

Gearbox Size :11 / 12 / 15 / 16 / 19 / 23 / 24 / 27 / 29 / 35

Output Type :01 / 1K / 1L



Parts may differ for special applications.

Standard Part List

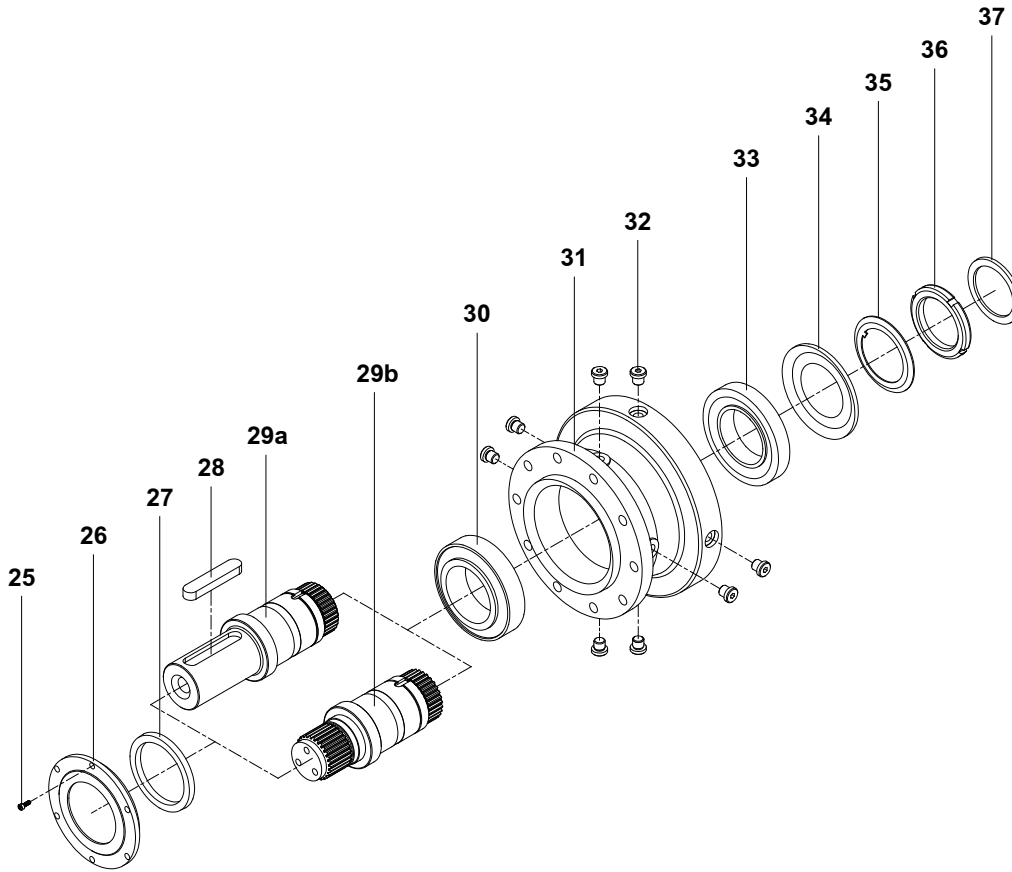
1- Bolt	5b- Splined Output shaft	10- Bearing
2- Seal Cover	6- Bearing	11- Nilos Ring
3- Seal	7- Oil Plug	12- Tab washer
4- Key	8- Footed output	13- Locknuts
5a- Output Shaft	9- Lifting Bolts	14- Spacer



3.1.2- Version of Gearbox : PV / PN / PT

Gear Size :11 / 12 / 15 / 16 / 19 / 23 / 24

Output Type :01 / 1K / 1L



Parts may differ for special applications.

Standard Part List

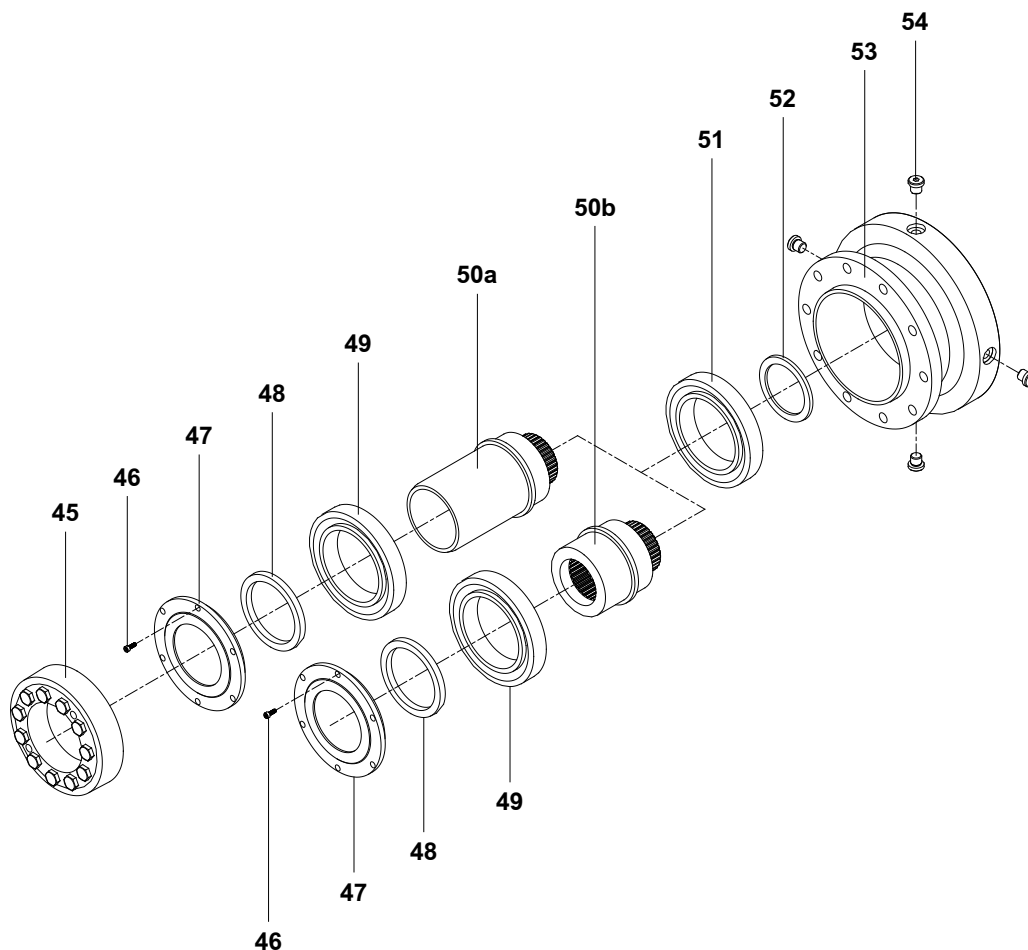
25- Bolt	29b- Spline Output Shaft	34- Nilos Ring
26- Seal Cover	30- Bearing	35- Tab washer
27- Seal	31- Output Flange	36- Locknuts
28- Key	32- Oil Plug	37- Spacer
29a- Output Shaft	33- Bearing	



3.1.3- Version of Gearbox : PV / PN / PT

Gear Size :11 / 12 / 15 / 16 / 19 / 23 / 24

Output Type :0S / 0K / 0L



Parts may differ for special applications.

Standard Part List

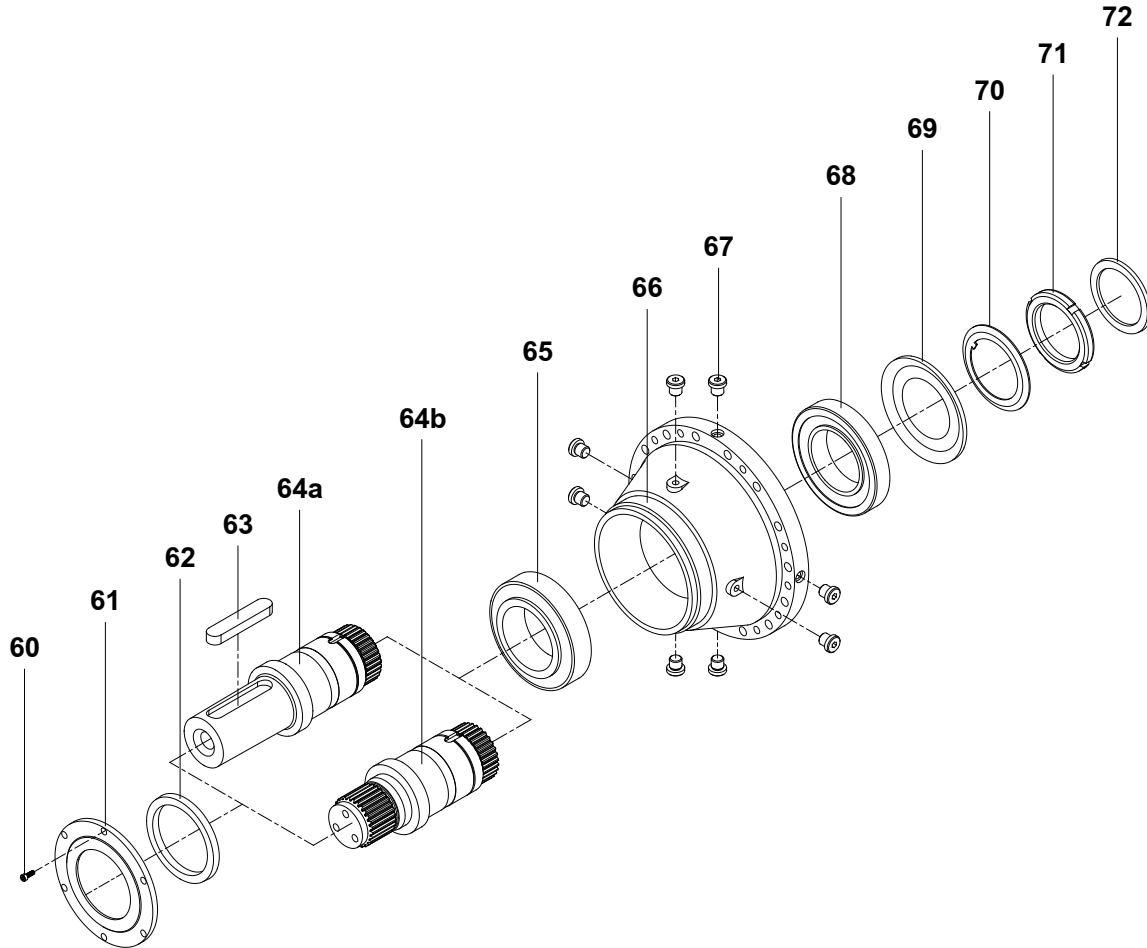
45- Shrink Disc	50a- Hollow Shaft	54- Oil Plug
46- Bolt	50b- Spline Shaft	
47- Seal Cover	51- Bearing	
48- Seal	52- Spacer	
49- Bearing	53- Output Flange	



3.1.4- Version of Gearbox : PV / PN / PT

Gear Size : 27 / 29 / 35

Output Type : 01 / 1K / 1L



Parts may differ for special applications.

Standard Part List

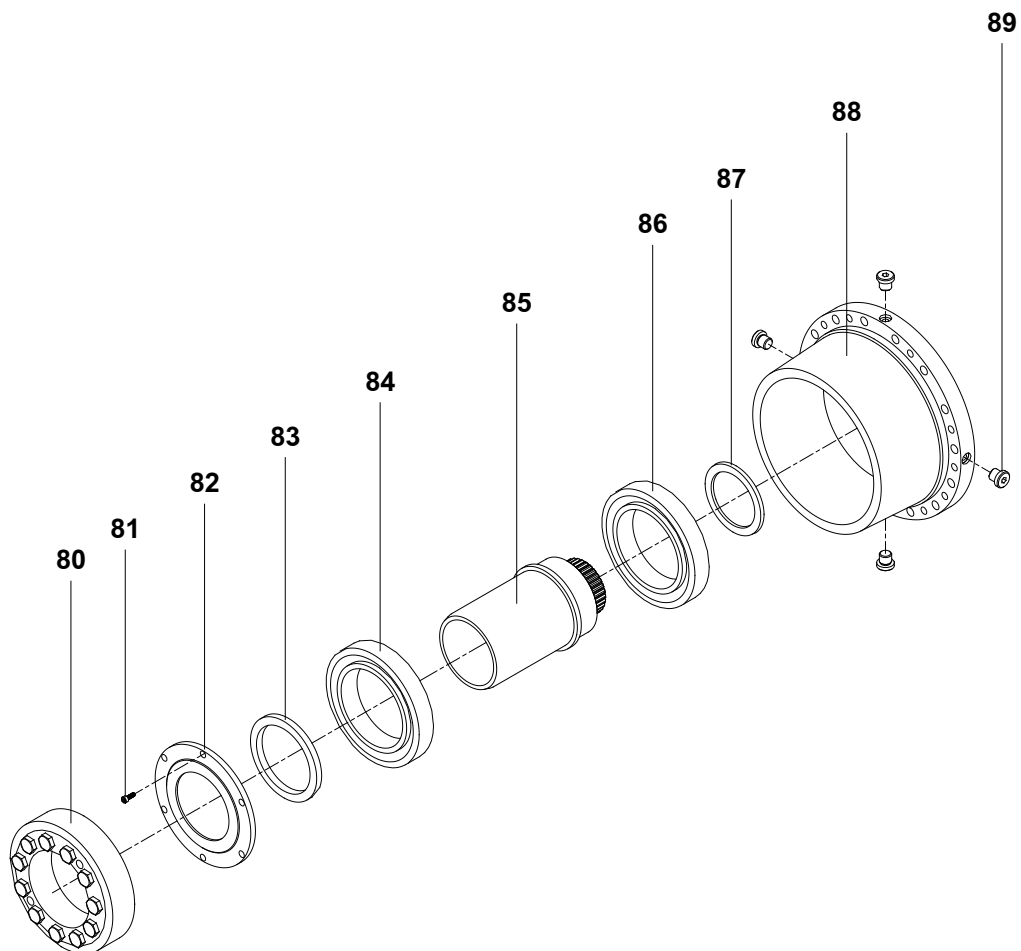
60- Bolt	64b- Spline Output Shaft	69- Nilos Ring
61- Seal Cover	65- Bearing	70- Tab washer
62- Seal	66- Housing	71- Locknuts
63- Key	67- Oil Plug	72- Spacer
64a- Output shaft	68- Bearing	



3.1.5- Version of Gearbox : PV / PN / PT

Gear Size : 27 / 29 / 35

Output Type : S0



Parts may differ for special applications.

Standard Part List

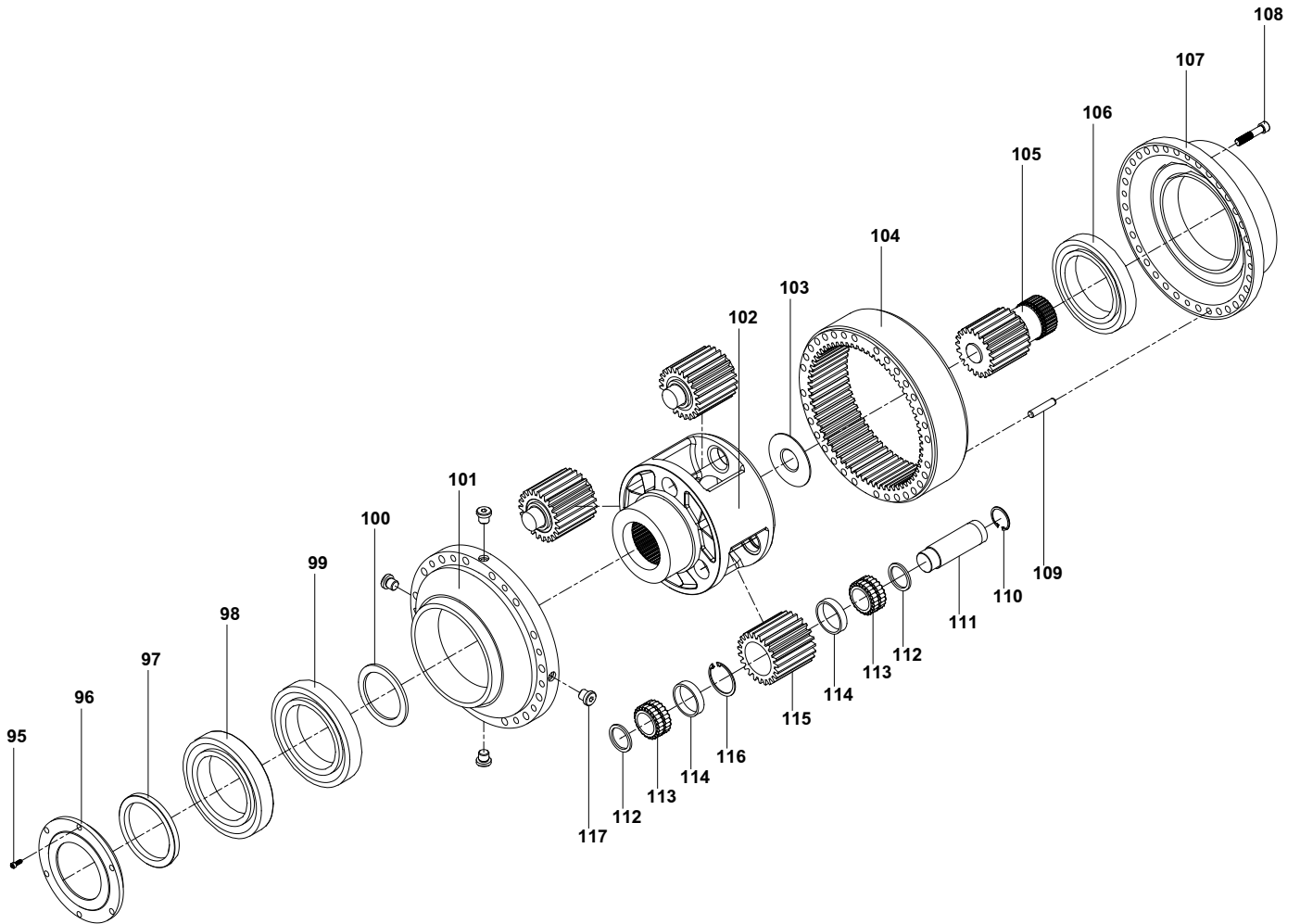
80- Shrink Disc	85- Hollow Shaft
81- Bolt	86- Bearing
82- Seal Cover	87- Spacer
83- Seal	88- Output shaft
84- Bearing	89- Oil Plug



3.1.6- Version of Gearbox : PV / PN / PT

Gear Size : 27 / 29 / 35

Output Type : 0K / 0L



Parts may differ for special applications.

Standard Part List

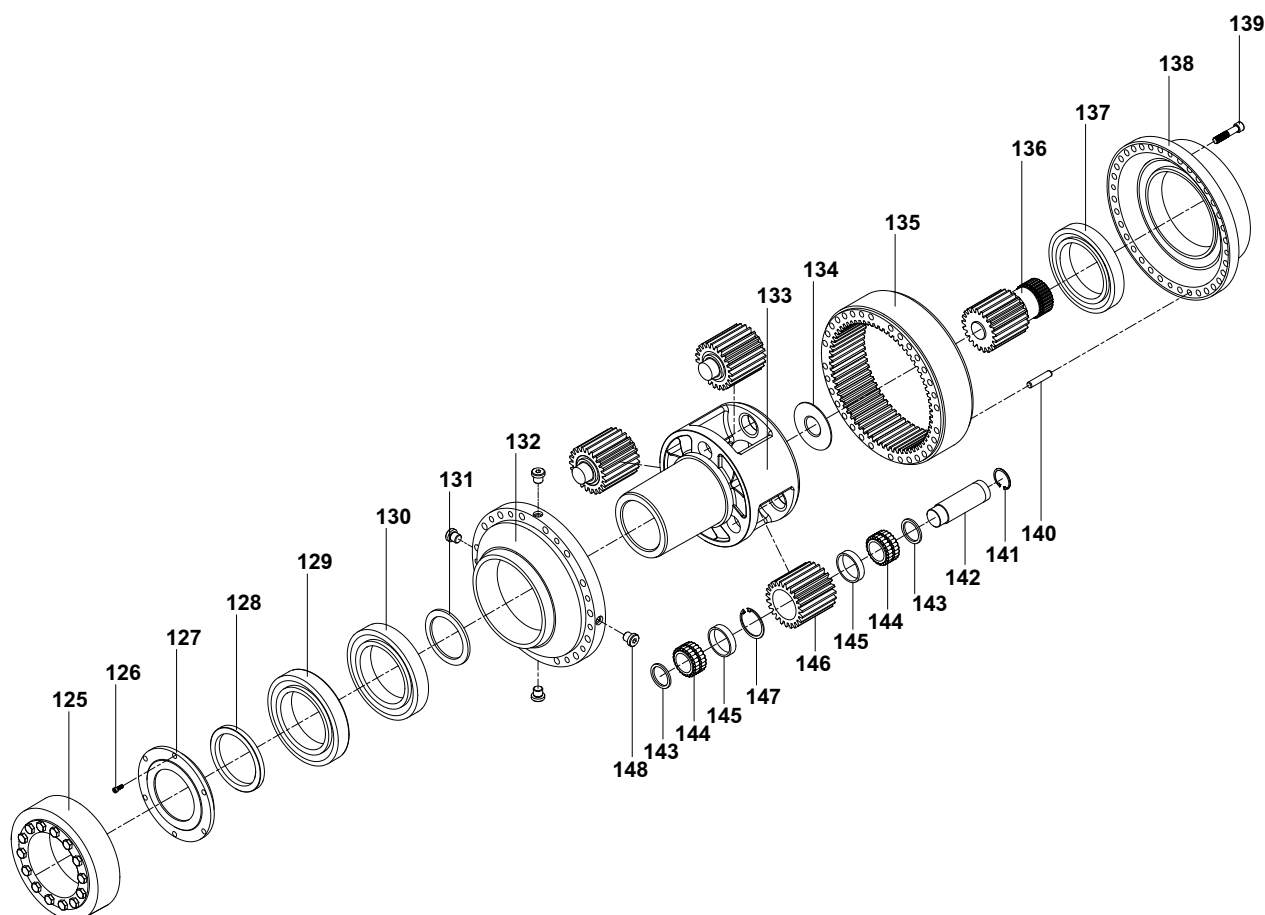
95- Bolt	100- Spacer	105- Sun Gear	110- Circlip	115- Planetary Gear
96- Seal Cover	101- Output shaft	106- Bearing	111- Pin	116- Circlip
97- Seal	102- Carrier	107- Flange	112- Washer	117- Oil Plug
98- Bearing	103- Washer	108- Bolt	113- Bearing	
99- Bearing	104- Internal Gear	109- Pin	114- Spacer	



3.1.7-Version of Gearbox : PV / PN / PT

Gear Size :29 / 35

Output Type :0S



Parts may differ for special applications.

Standard Part List

125- Shrink Disc	130- Bearing	135- Internal Gear	140- Pin	145- Spacer
126- Bolt	131- Spacer	136- Sun Gear	141- Circlip	146- Planetary Gear
127- Seal Cover	132- Output Flange	137- Bearing	142- Pin	147- Circlip
128- Seal	133- Carrier	138- Flange	143- Spacer	148- Oil Plug
129- Bearing	134- Washer	139- Bolt	144- Bearing	

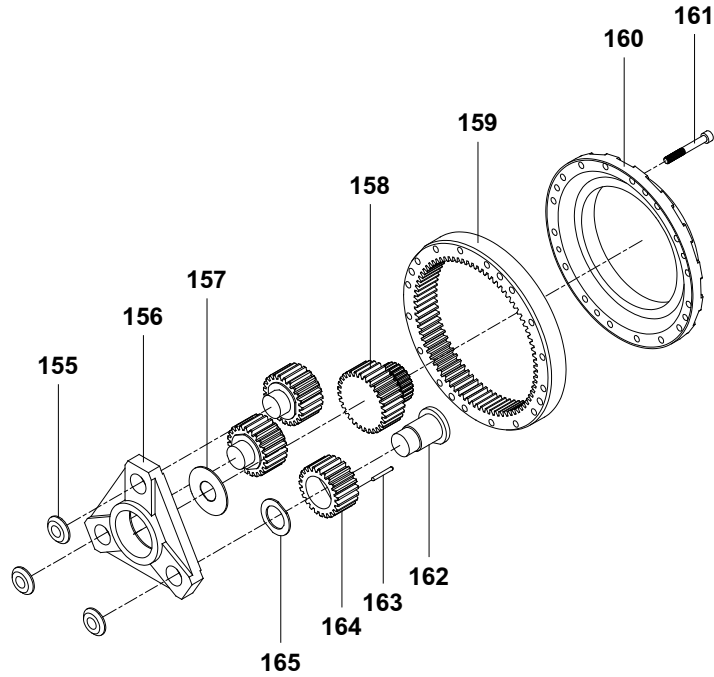


3.2- Gear Group

3.2.1 Version of Gearbox : PV / PN / PT / RV / RN / RT

Gear Size : 11/ 15

Output Type : ALL



Parts may differ for special applications.

Standard Part List

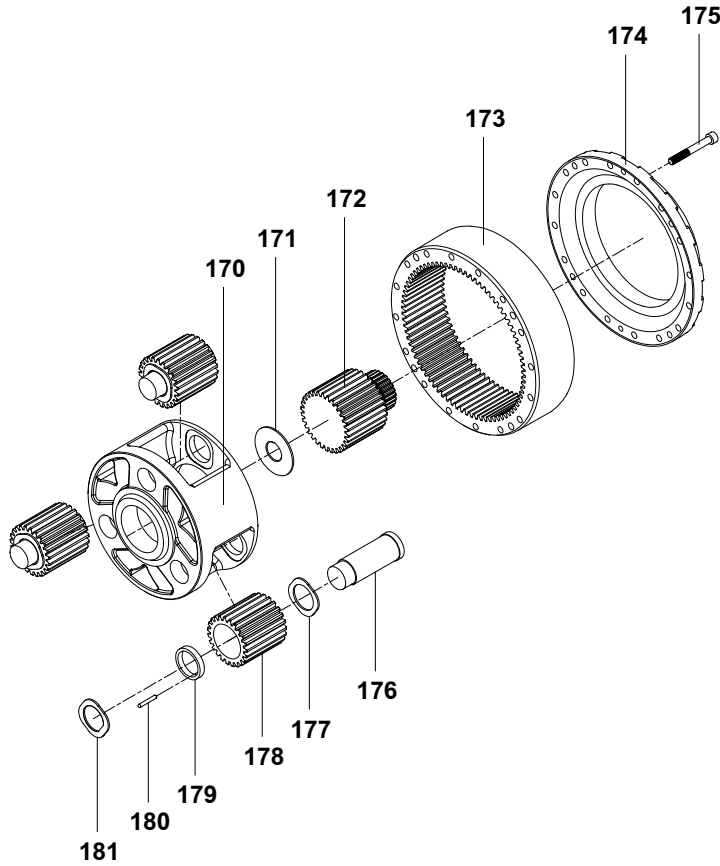
155- Washer	160- Flange	165- Washer
156- Carrier	161- Bolt	
157- Washer	162- Pin	
158- Sun Gear	163- Needle Roller	
159- Internal Gear	164- Planetary Gear	



3.2.2 Version of Gearbox : PV / PN / PT / RV / RN / RT

Gear Size :12 / 16 / 19 / 23 / 24 / 27 / 29 / 35

Output Type :ALL



Parts may differ for special applications.

Standard Part List

170- Carrier	175- Bolt	180- Needle Roller
171- Spacer	176- Pin	181- Washer
172- Sun Gear	177- Spacer	
173- Internal Gear	178- Planetary Gear	
174- Flange	179- Spacer	



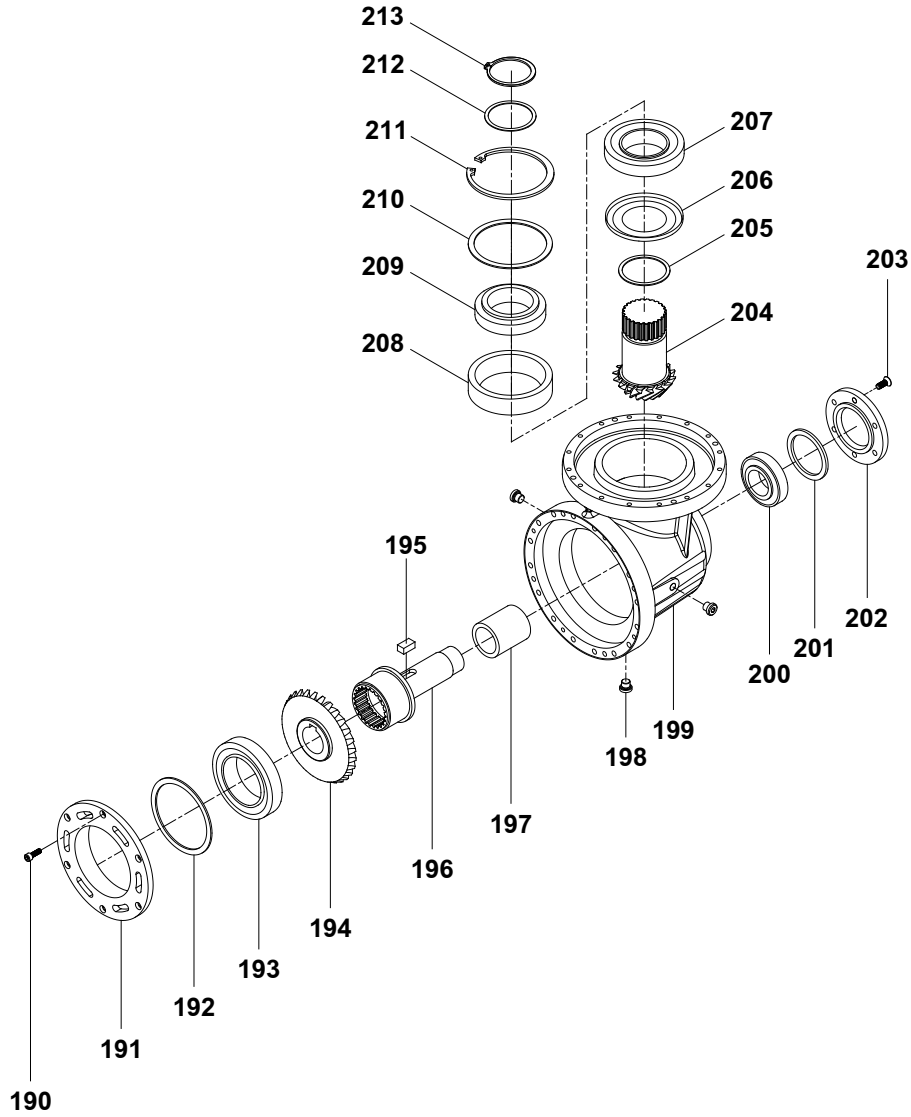
3.2.3 Version of Gearbox : PV / PN / PT / RV / RN / RT

Gear Size

:11/ 12 / 15 / 16 / 19 / 23 / 24 / 29 / 35

Output Type

:ALL (Bevel Stage)



Parts may differ for special applications.

Standard Part List

190- Bolt	195- Key	200- Bearing	205- Spacer	210- Spacer
191- Seal Cover	196- Shaft	201- Spacer	206- Nilos Ring	211- Circlip
192- Seal	197- Spacer	202- Cover	207- Bearing	212- Washer
193- Bearing	198- Oil Plug	203- Bolt	208- Spacer	213- Circlip
194- Bevel Gear	199- Flange	204- Gear	209- Bearing	

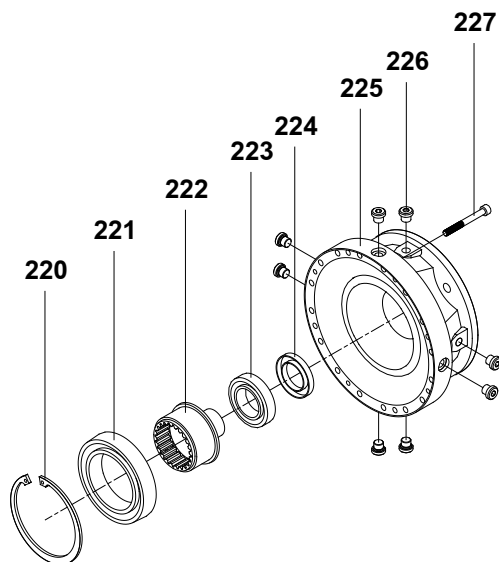


3.3 Input Side

3.3.1 Version of Gearbox : PV / PN / RV / RN

Gear Size : 11 / 12 / 15 / 16 / 19 / 23 / 24 / 29 / 35

Input Type : IEC B5 Flange Type



Parts may differ for special applications.

Standard Part List

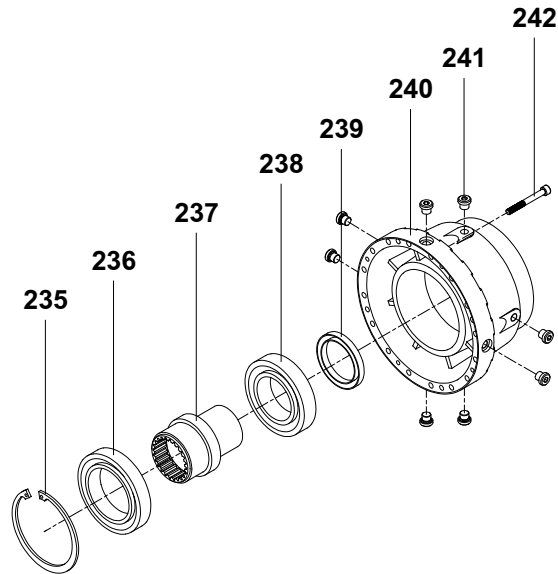
220- Circlip	225- Input Flange
221- Bearing	226- Oil Plug
222- Input Shaft	227- Bolt
223- Bearing	
224- Seal	



3.3.2 Version of Gearbox : PV / PN / RV / RN

Gear Size : 11/ 12 / 15 / 16 / 19 / 23 / 24 / 29 / 35

Input Type : C26 / M46 input type for Hydraulic motor



Parts may differ for special applications.

Standard Part List

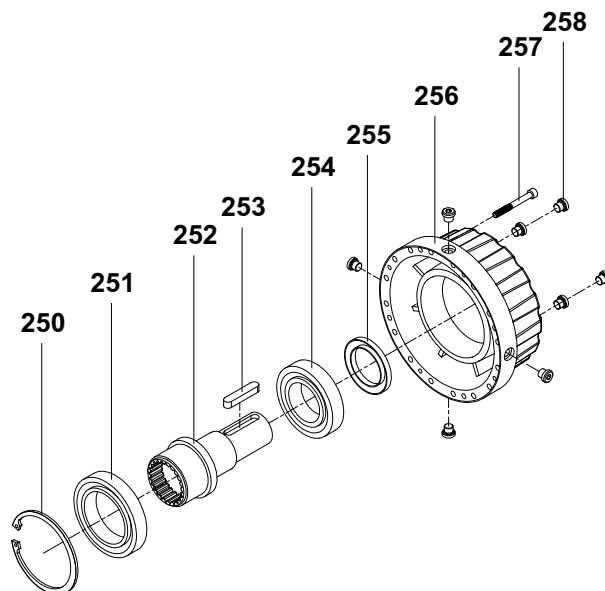
235- Circlip	240- Input Flange
236- Bearing	241- Plug
237- Input Shaft	242- Bolt
238- Bearing	
239- Seal	



3.3.3 Version of Gearbox : PV / PN / RV / RN

Gear Size :11 / 12 / 15 / 16 / 19 / 23 / 24 / 29 / 35

Input Type :Solid input shaft



Parts may differ for special applications.

Standard Part List

250- Circlip	255- Seal
251- Bearing	256- Input Flange
252- Input Shaft	257- Bolt
253- Key	258- Oil Plug
254- Bearing	



4- Things to Check Before the Gear Unit or Geared Motor is Installed

4.1- Safety notes for use in potentially explosive atmosphere



Explosive gas mixtures or concentration of dust can lead to severe or fatal injuries in conjunction with hot or moving parts of the gear unit / geared motor.

Before you install the gearbox you have to be sure that the gearbox is arrived with the all necessary equipment and without damage. Things to take into consideration before you start to install the unit ;

- You have received the correct operation manual of your product.
- The gearbox and all it's parts are transported without damage.
- The gearbox is stored correctly according the instructions in this manual.
- The nameplate is clearly visible and all data can be read.
- All the regulations and requirements are according to the currently valid national / regional regulations.
- The gearbox is used according it's intended use.



Intended use of Gearbox

The gearboxes covered by this manual can only be used in ATEX zone 2G, 2D, 3G, 3D and ignition class IIA / IIB.

The gear units are intended for industrial systems and may only be used in accordance the information provided in this manual and the nameplate of the gearbox. They comply with the applicable standards and regulations and meet the requirements of the directive 94/9/EC. The gearbox is started up, maintained and operated according this manual. The gearbox is incorporated with 94/9/EC confirming parts / machines.



A motor connected to the gear unit is only allowed to be operated in the frequency entries so that the data provided on nameplate of the gear unit is not exceeded and is accordance with the nameplate. The input speed range will be provided on the nameplate if YILMAZ REDUKTOR is informed that the gear unit will be used with frequency inverter. If not informed the nameplate will have a single fixed input speed and only this input speed is allowed. The electric motor and frequency inverter must be in accordance with 94/9/EC.



If the gear units input is used with variable speed gear unit, this must be informed to YILMAZ REDUKTOR before ordering and on the nameplate the allowed maximum and minimum input speeds (speed range) will be provided. If not mentioned during ordering the gear units input speed will be a fixed single speed and only this speed is allowed.



If the gear unit will be driven by belt / coupling / chain drive etc. the gear unit is only allowed to be used according the nameplate entries. Different speed, higher motor power, higher radial / axial loads etc. than nameplate is not allowed.



The ambient conditions must be accordance with the nameplate and no aggressive media must attack the paint and seals.



The gearbox maintenance (oil change / check) must be done according this manual.



4.2- Transportation

When the gearbox arrive, first check for any damage. If some damage observed, immediately contact the transport company and inform about damage. Contact YILMAZ for the damage and do not start installing the gear unit until is is agreed that the damage has no affect of operation.



Use the supplied eyebolts or lifting holes for lifting up the gear unit. The eyebolts are capable to carry the weight of gearboxes only. Do not hang additional loads. Lifting positions for different types of P series gear units are shown at next pages.

4.3- Storage

If the geared unit or geared motor will be stored up to 3 years refer to the following instructions ;

With Packing ;

- Use corrosion protection oil for the output shaft and connection surfaces like flange surface or foot assembling surface. Seal the unit in a plastic wrap and pack it in container. A moisture indicator should be placed around the container to observe the moisture. Relative atmospheric humidity should not exceed 50%. The container should be kept under roof which protects from snow and rain. Under this condition the gear unit can be stored up to 3 years with regular check.

Without Packing ;

- Use protection oil for the output shaft and connection surfaces like flange surface or foot assembling surface. If no packing is used and the gearbox is stored without packing, the ambient temperature should be between 5 to 60 Celsius degrees. The gearbox must be kept under enclosed roof with constant temperature and constant humidity not exceeding 50%. The storage should be free of dust and dirt and ventilated with filter. If the gearbox is stored without packing it is recommended not to store more than 2 years and regularly checking is recommended during this time.

If stored in open protect against insect damage.



4.4.1 P..01L Types Lifting Positions

Type	Single Stage	MultiStage
PV..01L (For P11 To P24)		
PV..01L* (For P24 To P35)		
PN..01L (For P11 To P24)		

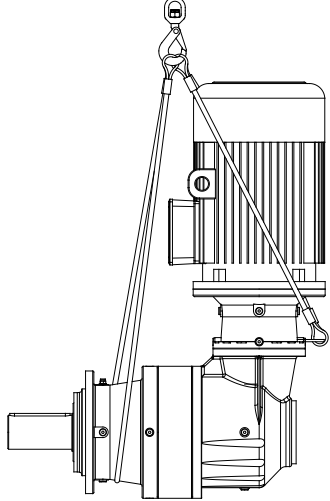
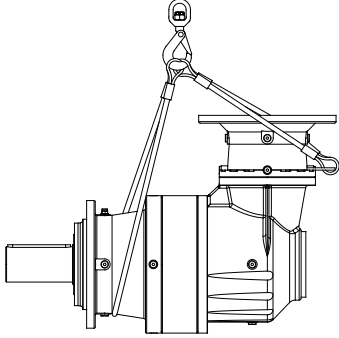
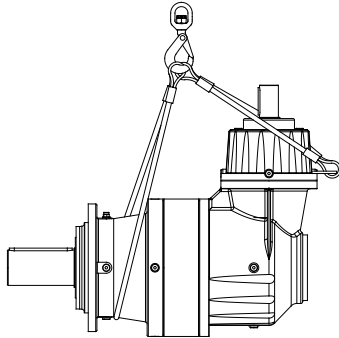


4.4.1 P...01L Types Lifting Positions

Type	Single Stage	MultiStage
PN..01L* (For P11 To P24)		
PT..01L (For P11 To P24)		
PT..01L* (For P24 To P35)		

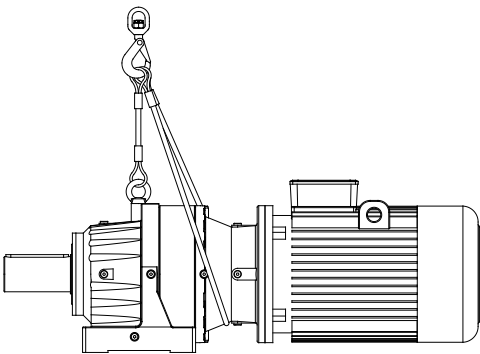
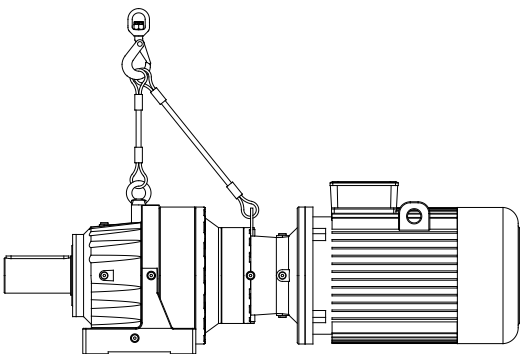
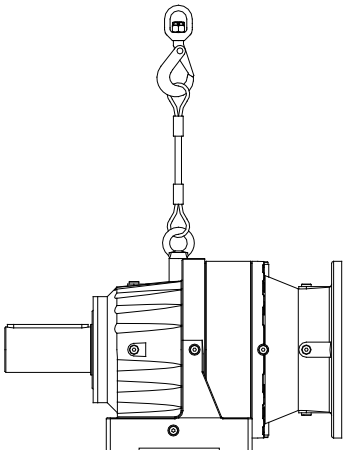
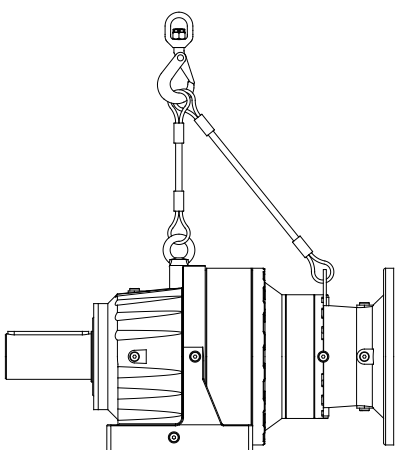
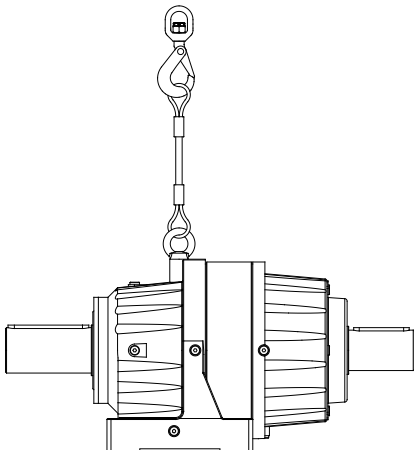
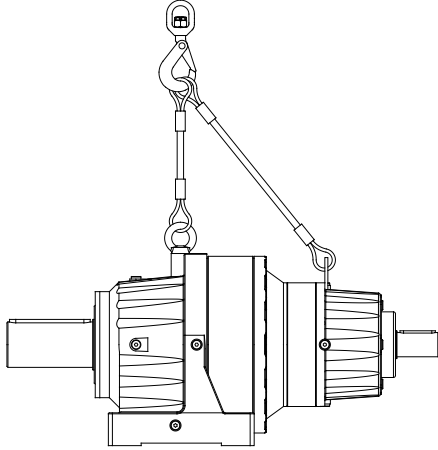


4.4.2 P..01K Types Lifting Positions

Type	Single Stage	MultiStage
PV..01K (For P11 To P24)	NOT APPLICABLE	
PN..01K* (For P24 To P35)	NOT APPLICABLE	
PT..01K (For P11 To P24)	NOT APPLICABLE	

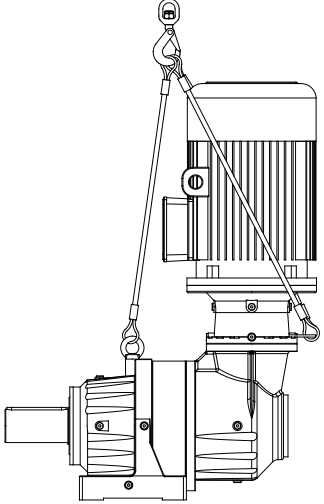
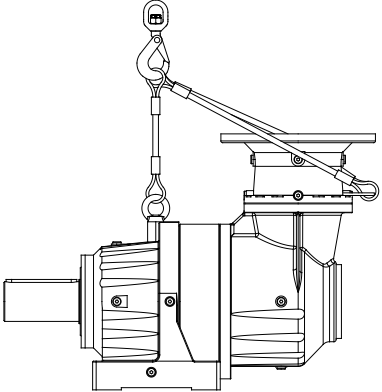
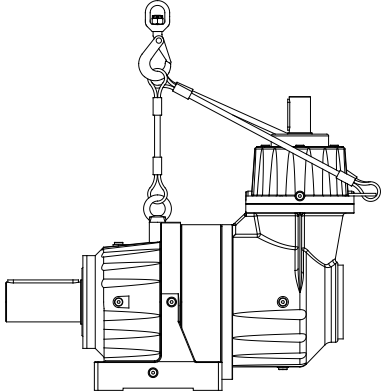


4.4.3 R...01L Types Lifting Positions

Type	Single Stage	MultiStage
RV..01L		
RN..01L		
RT..01L		

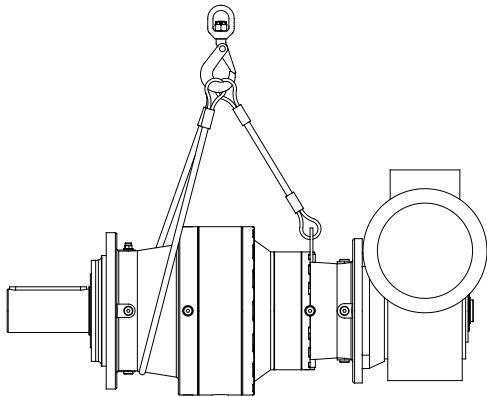
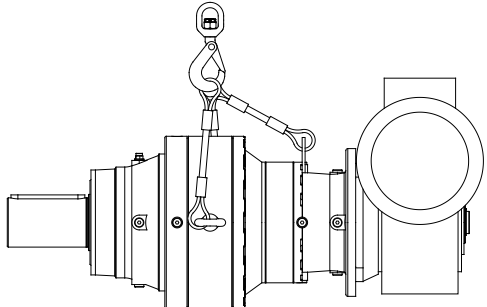
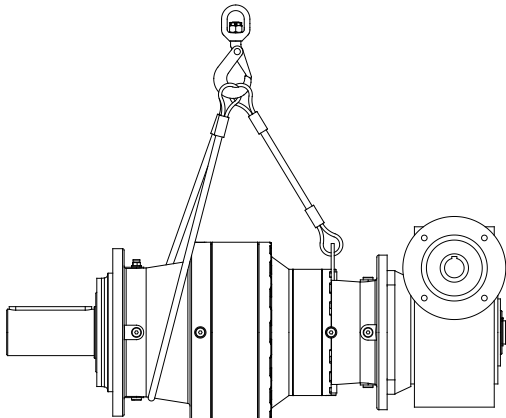
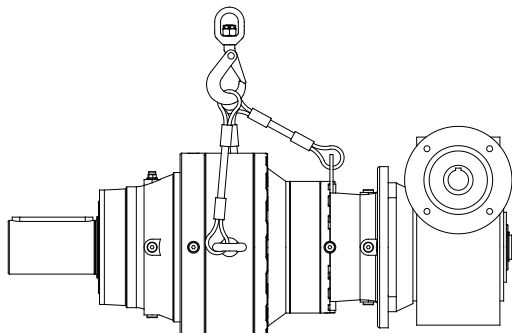
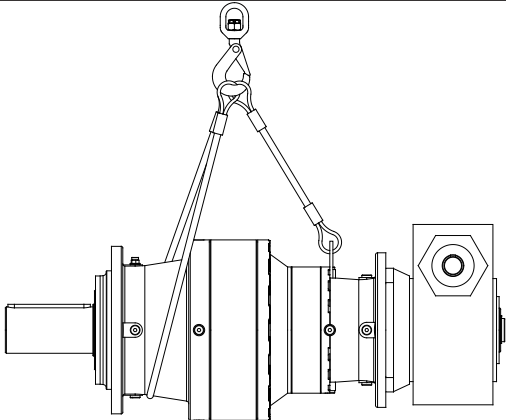
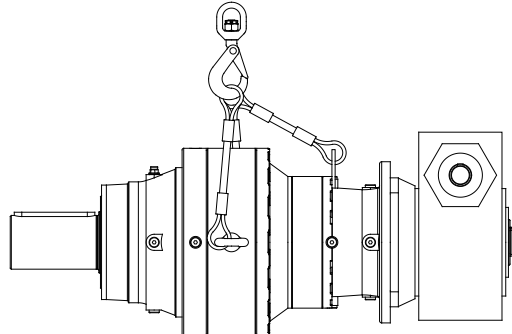


4.4.4 R...01K Types Lifting Positions

Type	Single Stage	MultiStage
RV..01K	NOT APPLICABLE	
RN..01K	NOT APPLICABLE	
RT..01K*	NOT APPLICABLE	

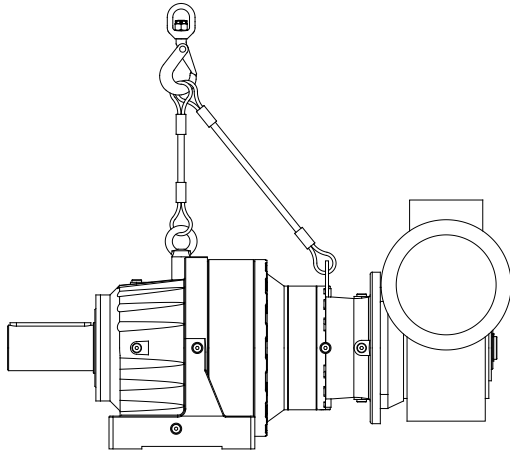
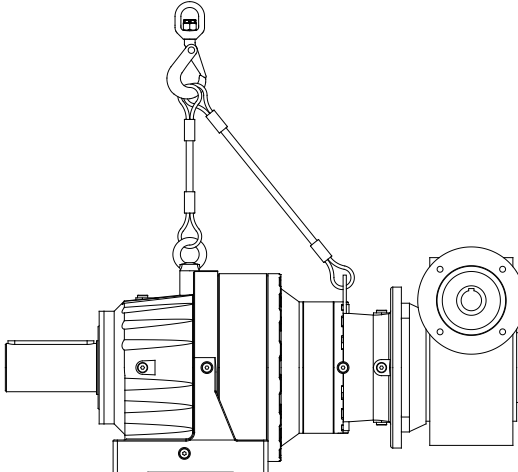
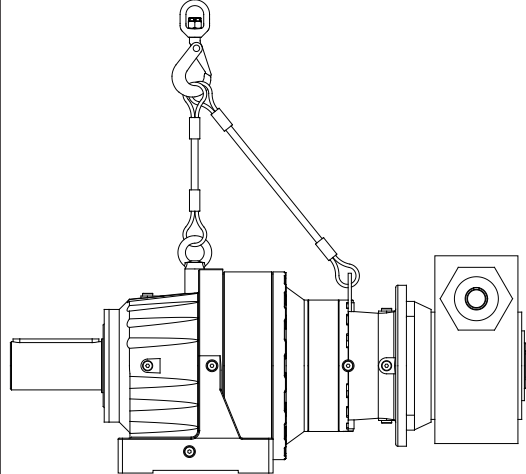


4.4.5 P Series Combined with E Series Lifting Positions

Type	For P11 To P24	For P27 to P35
PN...L.01+EV125		
PN...L.01+EN125		
PN...L.01+ET125		



4.4.6 R Series Combined with E Series Lifting Positions

Type	For P11 To P24	For P27 to P35
RN...L.01+EV125		NOT APPLICABLE
RN...L.01+EN125		NOT APPLICABLE
RN...L.01+ET125		NOT APPLICABLE



5- Installing the Gear Unit

5.1- Before you start ;

- Observe the gear unit for damages of storage or transportation. If there is any damage please contact YILMAZ REDUKTOR.
- Be sure that you have all the necessary equipment for installing like ; spanners, torque wrench, shims and distance rings, fixing devices for input and output elements, lubricant, bolt adhesive / locktide etc.



5.2- Check Nameplate of the Gear Unit ;

- ATEX conforming gear units have a nameplate indicating the “Ex” sign shown on the left side and the following information ;
- Equipment group
- Ex category
- Ex zone
- Temperature class
- Maximum surface temperature

If you can not see this sign and values, your gearbox is not intended for use on potentially explosive atmosphere. If some of the data can not be read because of some reason, please contact YILMAZ REDUKTOR.

5.3- Check the Ambient Conditions and Temperature ;

Have measures been taken to ensure that no potentially explosive atmosphere, oils, acids, gases, vapors or radiated interference are present when the gear unit is being installed. The ambient temperature must be in accordance with the oil tables given on the manual. If it is different contact YILMAZ REDUKTOR for special solutions.



The ambient air temperature must not exceed 40 degrees celcius as mentioned on the nameplate. The cooling air surrounding the gear unit must below 40 degrees and the gear unit must not subject to heating from external sources. The gear unit surface must be kept clean and sufficiently ventilated.



Total thickness of all paintings and coatings on gear unit must be smaller then 2 mm. Please contact us before making additional paintings or coatings on gear unit.

5.4- Check Fitting Elements and the Shaft Dimensions to Fit;

All external elements that will be fitted to the gear unit must be ATEX conforming.

The shaft / flange dimensions are shown on next page. Use correct tolerances to fit external elements. Observe the assembly instructions provided in this manual.



Only belts with sufficient shunt resistance <10^9 ohm are allowed.

Operating Instructions

P Series

Installing



Never strike belt pulleys, coupling, pinions etc. with a hammer when pulling them onto the shaft end. This could result in damage to bearings, the housing and the shaft.

Power transmission elements must be balanced after fitting and must not give rise to any permissible radial or axial forces.



Observe the nameplate for maximum allowed radial and axial load. The external radial and axial load must not exceed the provided values on the nameplate.

Type	Hollow Shaft Diameter with Shrink Disc	Tolerance (H7)	Customer Shaft Diameter with Shrink Disc	Tolerance (h6)	Solid Output Shaft Diameter	Output Shaft Tolerance
P11..	42	+0.03 0	42	0 -0.02	50	+0.02 0
P12..	52	+0.03 0	52	0 -0.02	50	+0.02 0
P15..	75	+0.03 0	75	0 -0.02	60	+0.02 0
P16..	75	+0.03 0	75	0 -0.02	60	+0.02 0
P19..	90	+0.04 0	90	0 -0.02	80	+0.02 0
P23..	100	+0.04 0	100	0 -0.02	90	+0.04 0.01
P24..	100	+0.04 0	100	0 -0.03	90	+0.04 +0.01
P27..	130	+0.04 0	130	0 -0.03	110	+0.04 +0.01
P29..	135	+0.04 0	135	0 -0.03	120	+0.04 +0.01
P35..	140	+0.04 0	140	0 -0.03	140	+0.04 +0.02



5.5- Check the Voltage Supply ;

ATEX conforming gear units are supplied by YILMAZ without motor. The motor that will be fitted must have ATEX certificate and the instruction manual of the electric motor provider must be observed. Observe the name plate of the electric motor and the instructions of the supplier. Use experienced electric technician. The gearbox and the motor must be grounded to prevent potential differences of earth and gearbox / motor.



Using wrong connection or voltage can damage the electric motor or environment. The electric connection must be done by experienced electric technician.



The gearbox and the motor must be grounded to prevent potential difference of earth and gearbox / motor after installation before starting up.

5.6- Check the Mounting Position ;

The mounting position must be in accordance with the mounting position mentioned on the name plate. If different please contact YILMAZ REDUKTOR for possibilities of using in a different mounting position then indicated on the name plate without informing YILMAZ REDUKTOR will cancel the ATEX conformity and YILMAZ does not take any responsibility.



Do not mix synthetic oils with mineral oils which can cause serious damage on the gear unit.

5.7- Usage of Breather Plug ;

Breather plugs are supplied as a standard part for ATEX conforming gear units. The breather plug is attached to the gear unit and must be changed with the most top plug according to the mounting position. Take out the plug over the gear box and replace it with the supplied breather plug after assembling to its place and before start-up.



The breather plugs are opened at 0.2 bar pressure.



After opening the plugs use Loctite when locking them again.



All plug points are not machined. Only plugs according mounting position is machined. If no mounting position is mentioned by ordering the standard M1 position plugs are machined.





5.8- Check the oil level ;

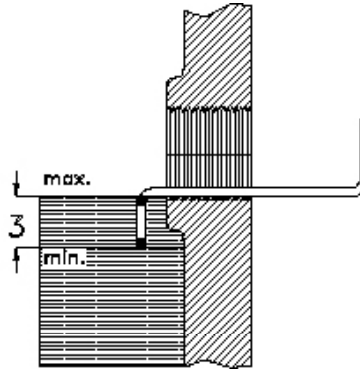
On the mounting position tables the oil level plug is shown. Please refer to those tables and be sure that the oil level is correct according the mounting position. Use a wire as shown below for checking the oil level entering from the level plug. The oil level must be within 3mm from the plugs entering point as shown below. If you need to adjust the oil level refer to the oil tables given on this manual and be sure you are using the correct oil. Observe the nameplate for the correct oil.



After checking the oil level of gear unit tighten the screws very carefully to prevent oil leakage.



Do not mix synthetic oils with mineral which can cause serious damage on the gear unit.



5.9- Check shaft ends and mounting faces;

Before you start to installing be sure that all the connection elements are free of oil and dust. The output shaft may be protected by anti-corrosion oil. Please remove this using available solvents on your market. By using this do not touch sealing lips or painting of the housing.

5.10- Cover abrasive ambient;

If the gear unit will be placed on a abrasive ambient be sure that the output seals are covered so that no abrasive material, chemicals or water touches the seals. Any pressure coming from outside over the seals can cause that the out staying substances to enter the gearbox and cause serious damage to the gear unit. If pressure or abrasive material can not be prevented from coming over the sealing, contact YILMAZ for solutions.



Abrasive material, chemicals, water, positive or negative pressure exceeding 0,2 bar can affect or damage the sealing lip or output shaft. Inside entering substances from the seals can cause serious damage to the gear unit.



To avoid temperature rising in case of dust cover on the housing of the gearbox, the housing have to be cleaned regularly.

5.11- Check accessibility to filling, breather and drain plugs;

The filling, breather and drain plugs must be freely accessible for further checking and service.



6- Mechanical Installation

The mounting plate must be rigid enough not allowing torsions, flat enough to prevent strains by tightening the bolts and stable enough not allowing vibrations. By using chain drives this becomes much more important because of the polygon effect on chain drives. According to your connection elements the maximal permitted radial and axial load of the gear unit must be in accordance with your application. Check the product catalogue for permitted radial loads and calculation.



If the output or input shaft is overloaded by radial or axial loads it can cause serious damage to the gear unit.

Secure the gear unit using 8.8 or higher quality bolts.



All bolts are locked by use of locktite adhesives or gear-shims on the gearbox. By assembling the gear unit locktides adhesives or gear-shims must be used to prevent loosening of bolts.



Cover all the turning parts from human entering or touching. Turning parts can cause severe or fatal injuries.

For different kind of basic installations refer to the following illustrations.



Only ATEX-approved input and output elements are allowed to be used, assuming the elements are subject to Directive 94/9/EC

6.1- Installing gear units in category II2G/D-II3G/D

Explosion-proof gear units comply with the design requirements for unit group II, category 2G,2D,3D,3G. These units are intended for use in zones 1 and 21.



The gear units in category II2D must be used in ambient temperature between -20 C to +40 C only. If different ambient conditions this must be informed before order and the name plate must be in accordance with the ambient conditions.



The temperature class depends on the speed, type and mounting position of the gearbox and is indicated on the name plate. Temperature classes from T4 to T6 are provided by YILMAZ REDUKTOR.



The surface temperature of the gearbox must not exceed the provided max. surface temperature on the name plate. After all installations finished and the gearbox is started up according this manual let the gear unit run 4 hours at full load and check the surface temperature and the ambient temperature. Check the following:

$(40-T_a)+T_w < T_{max}$. of nameplate (T_a : Ambient Temp., T_w : Surface Temp)

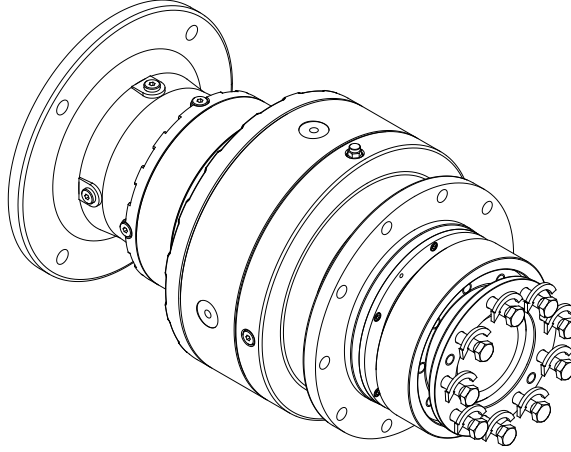


If the result is higher then T_{max} , immediately stop the system and contact YILMAZ REDUKTOR.

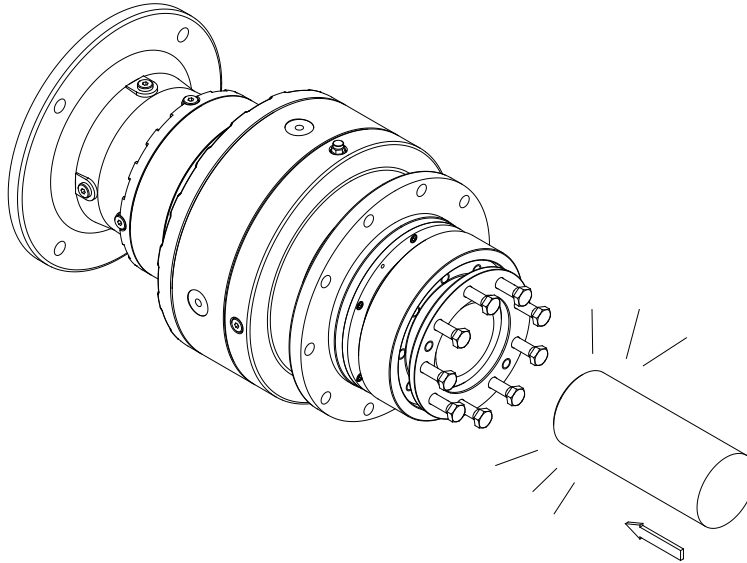


6.2- Assembling customer shaft with shrink disk

6.2.1- Loosen the bolts of the shrink disk

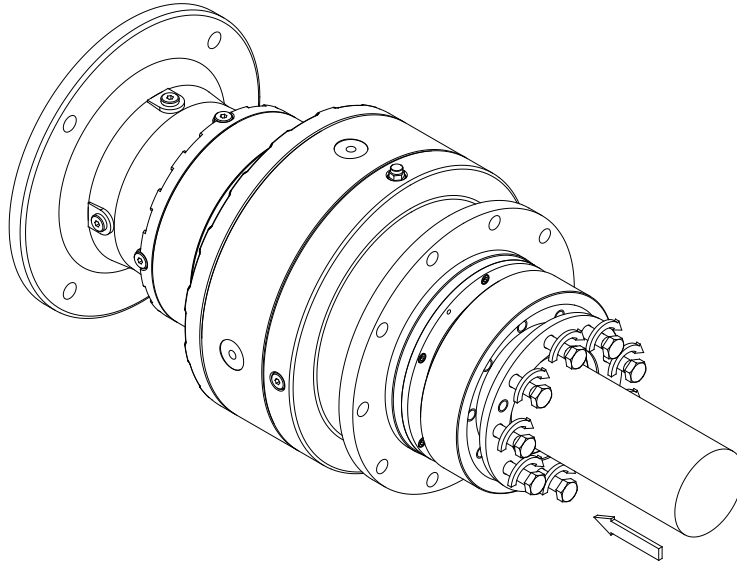


6.2.2- Use a solvent available in your market to clean all the dirt and oil from the shaft and shrink disk hollow. The surfaces must be free from oil or any dirt. The solvent must be removed from the surfaces as well.





6.2.3- Insert the shaft and tighten the bolts as shown. Be sure that there is a clearance between the shrink disc shoulder and the hollow shaft shoulder of the gearbox.

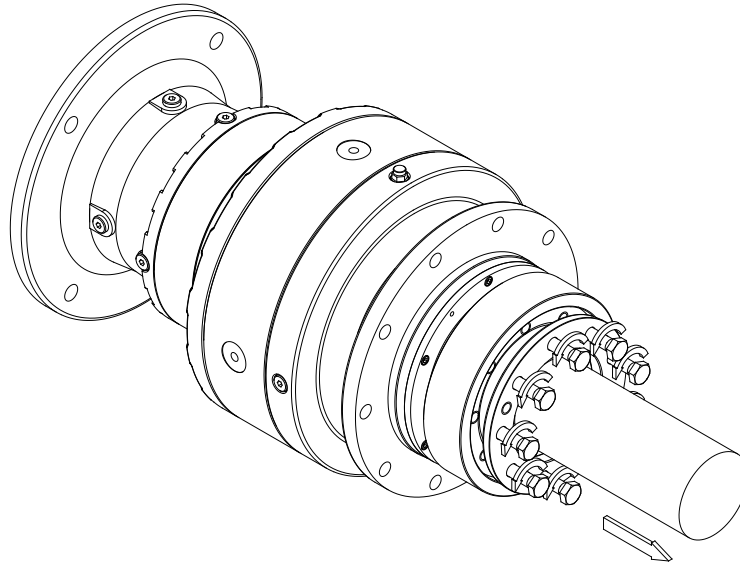


Type	Bolt	Tightening Torque [Nm]
P/R11..0S	M8	30
P/R12..0S	M8	30
P/R15..0S	M10	59
P/R16..0S	M10	59
P/R19..0S	M12	100
P/R23..0S	M14	160
P/R24..0S	M14	160
P/R27..0S	M16	250
P/R29..0S	M16	250
P/R35..0S	M16	250



6.3- Disassembling customer shaft with shrink disc

6.3.1- Loosen the bolts of the shrink disc and take out the shaft.

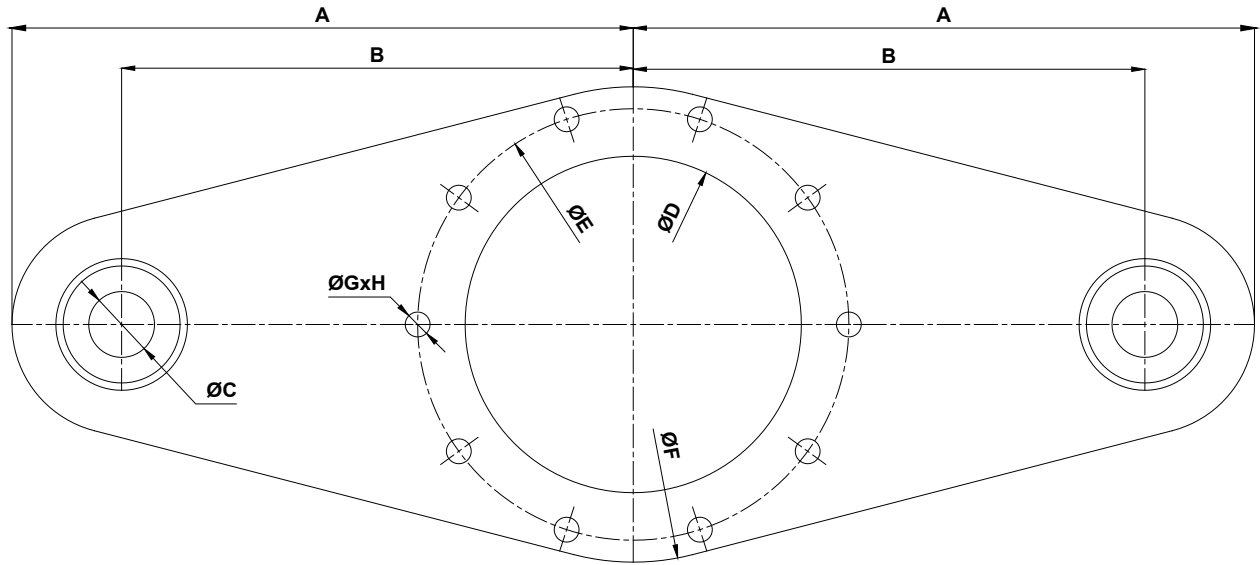




6.4 Assembling Gear Unit with Torque Arm

6.4.1- Dimensions

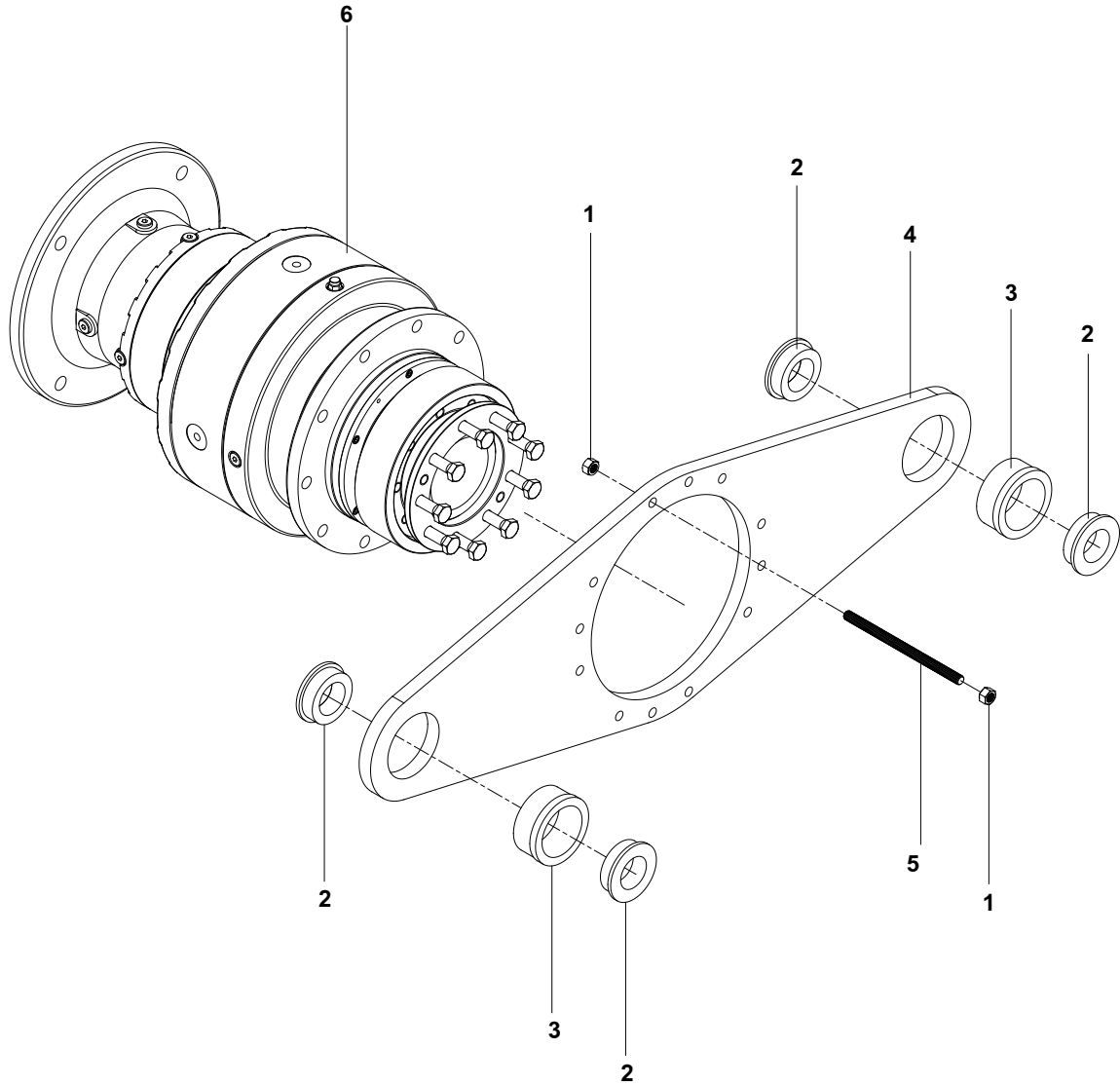
Torque arm dimension shown on below according to size of planetary gearbox.



	A	B	ØC	ØD	ØE	ØF	ØGxH
P11	280	225	30	110	176	185	Ø11x8
P12	280	225	30	110	176	185	Ø11x8
P15	310	250	35	150	195	222	Ø13x10
P16	310	250	35	150	195	222	Ø13x10
P19	370	300	40	200	250	280	Ø15x12
P23	425	350	45	230	295	325	Ø17x10
P24	525	450	45	278	324	350	Ø13x12
P27	580	500	50	340	370	400	Ø17x25
P29	640	550	60	358	390	428	Ø17x28
P35	700	600	70	385	415	450	Ø17x28



6.4.2- Assemble the parts as shown bellow

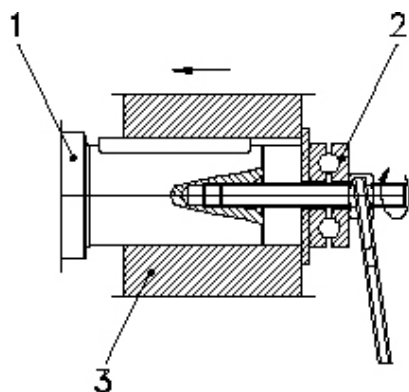


1- Nut	4- Torque arm
2- Rubber buffer	5- Bolt
3- Spacer	6- Gearbox



6.5 Fitting output shaft elements

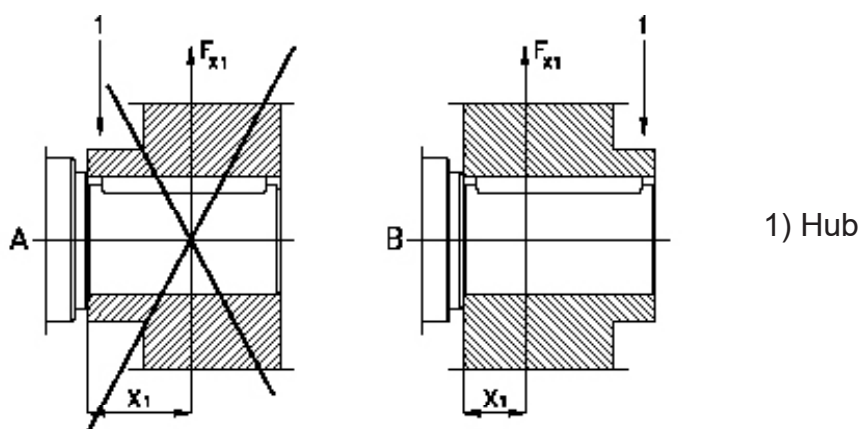
Use the following illustration to assemble output shaft units



- 1) Gear shaft end
- 2) Thrust bearing
- 3) Coupling hub

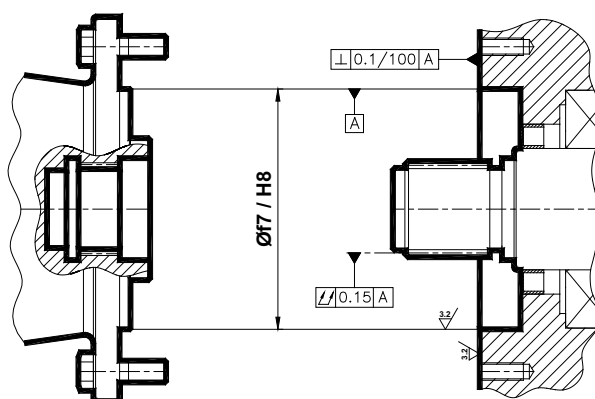
6.6- Correct position of output shaft elements

The Output Shaft unit (transmission elements) must be placed as close as possible to the gear unit so that the radial load is as close as possible to the gear unit.



6.7- Correct position of splined output shaft

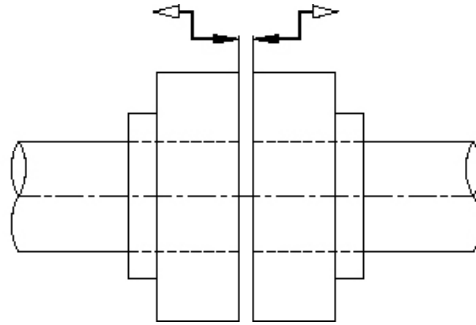
Please refer the following mounting tolerances for splined output. Be sure that there is no eccentricity between axis.



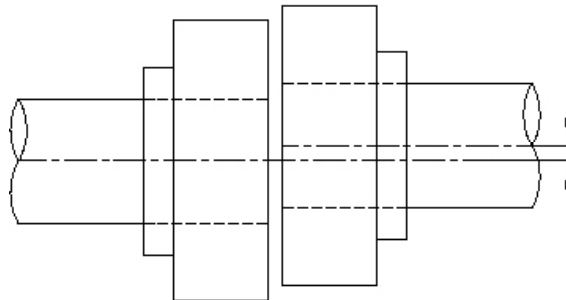


6.8- Fitting Couplings

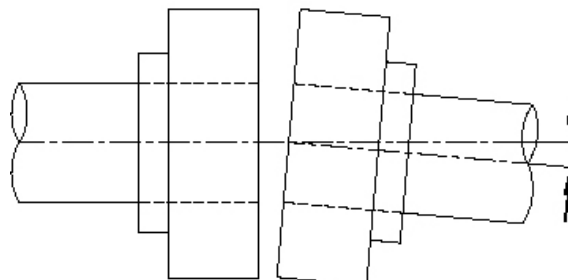
6.8.1- By fitting couplings be sure that there is some clearance between the two elements



6.8.2- By fitting couplings be sure that there is no eccentricity between the two shafts.



6.8.3- By fitting couplings be sure that the two shafts are not angular miss-aligned.

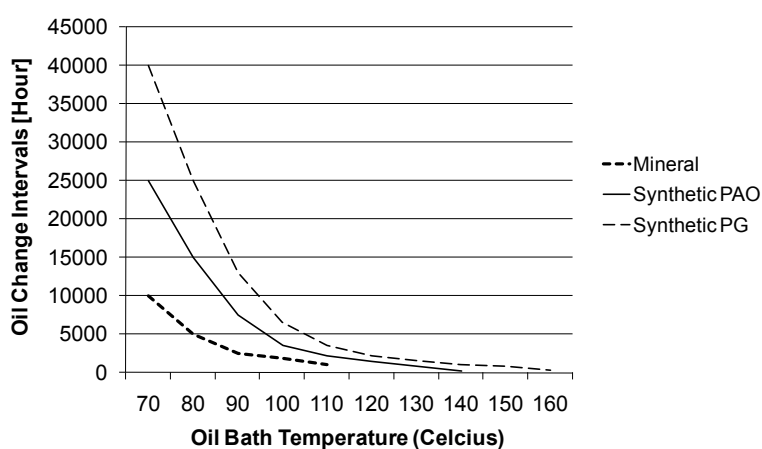




7- Maintenance and Inspections

Under normal ambient and working conditions the gear unit should be checked according the following intervals. (For definition of normal working conditions refer to the product catalogue : “Selecting Gearbox” section) ;

Item to Check / Replace	Every 3000 Working Hours or Every 6 Months	Every 4000 Working Hours	Every 10000 Working Hours or Every 3 Years	Every 25000 Working Hours
Check for Oil Leakage	x			
Check for Oil Level	x			
Check for Oil Leakage from Seals	x			
Check Bearing's Noise		x (Change if Necessary)		
Change Mineral Oil			x (See Below for Details)	
Change Synthetic - PAO Oil				x (See Below for Details)
Change Sealing				x
Change Bearing Grease				x
Change Bearings				x
Check for Noise Changes				x



For normal ambient conditions 70 degrees celsius oil bath temp. should be taken as reference

* For our P series gearboxes synthetic oil is used unless it is differently ordered. For oil type and quantities refer to the following tables.

Operating Instructions

P Series

Lubrication



8- Lubrication

8.1- Oil Types

Lubricant	DIN 51517-3	Ambient Temperature [°C]		ISO VG	Beyond Petroleum	Castrol	Klüber Lubrication	Mobil	Shell
		Dip Lubrication	Forced Lubrication						
Mineral Oils	CLP	0 ... +50	–	680	Energol GR-XP 680	Alpha SP 680	Klüberoil GEM 1-680 N	Mobilgear XMP 680	Omala 680
		-5 ... +45	–	460	Energol GR-XP 460	Alpha SP 460	Klüberoil GEM 1-460 N	Mobilgear XMP 460	Omala F460
		-10 ... +40	+15 ... +40	320	Energol GR-XP 320	Alpha SP 320	Klüberoil GEM 1-320 N	Mobilgear XMP 320	Omala F320
		-15 ... +30	+10 ... +30	220	Energol GR-XP 220	Alpha SP 220	Klüberoil GEM 1-220 N	Mobilgear XMP 220	Omala F220
		-20 ... +20	+5 ... +20	150	Energol GR-XP-150	Alpha SP 150	Klüberoil GEM1-150 N	Mobilgear XMP150	Omala 150
		-25... +10	+3 ... +10	100	Energol GR-XP 100	Alpha SP 100	Klüberoil GEM 1-100 N	–	Omala 100
Synthetic Oils	CLP PG	-10 ... +60	–	680	Energysyn SG-XP 680	–	Klübersynth GH 6 -680	Mobil Glygoyle 680	Tivela S 680
		-20 ... +50	–	460	Energysyn SG-XP460	Aphasyn PG460	Klübersynth GH 6-460	Mobil Glygoyle 460	Tivela S 460
		-25 ... +40	+5 ... +40	320	Energysyn SG-XP320	Aphasyn PG320	Klübersynth GH 6-320	Mobil Glygoyle 320	Tivela S 320
		-30 ... +30	0 ... +30	220	Energysyn SG-XP 220	Aphasyn PG 220	Klübersynth GH 6-220	–	Tivela S 220
		-35 ... +20	-5 ... +20	150	Energysyn SG-XP 150	Aphasyn PG 150	Klübersynth GH 6 -150	–	Tivela S 150
		-40 ... +10	-8 ... +10	100	–	–	Klübersynth GH 6 -100	–	–
	CLP HC	-10 ... +60	–	680	–	–	Klübersynth GEM4-680 N	Mobilgear SHCXMP680	–
		-20 ... +50	–	460	Energysyn EP-XF 460	Alphasyn T 460	Klübersynth GEM4-460 N	Mobilgear SHC XMP460	Omala HD 460
		-25 ... +40	+5 ... +40	320	Energysyn EP-XF 320	Alphasyn T 320	Klübersynth GEM4-320 N	Mobilgear SHC XMP 320	Omala HD 320
		-30 ... +30	0 ... +30	220	Energysyn EP-XF 220	Alphasyn T 220	Klübersynth GEM4-220 N	Mobilgear SHC XMP 220	Omala HD 220
		-35 ... +20	-5 ... +20	150	Energysyn EP-XF 150	Alphasyn T 150	Klübersynth GEM4-150 N	Mobilgear SHC XMP 150	Omala HD 150
		-40 ... +10	-8 ... +10	100	–	–	Klübersynth GEM4-100 N	–	–
Food Grade Oil	CLP NSF H1	-15 ... +25	+5 ... +25	320	–	Optileb GT 320	Klüberoil 4 UH1-320 N	Mobil SHC Cibus 320	Cassida Fluid GL-320
Bio degradable Oil	CLP E	-25 ... +40	+5 ... +40	320	–	Tribol BioTop 1418-320	Klübersynth GEM 2-320	–	–
Mineral Greases [-20 +130 Working Temperatures °C]					Energrease LS 3	Spheerol AP3	Centoplex 2 EP	Mobilux EP 3	Alvania RL3
Synthetic Greases [-30 +130 Working Temperatures °C]					Energrease SY 2202	–	Petamo GHY 133 N	Mobiltemp SHC100	Cassida RLS 2



8.2- Changing the oil

Refer to the nameplate to find out the correct oil filled inside the gearbox.

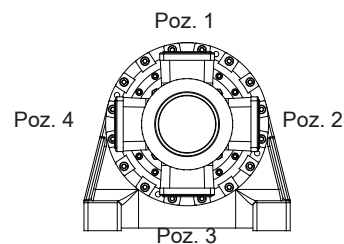
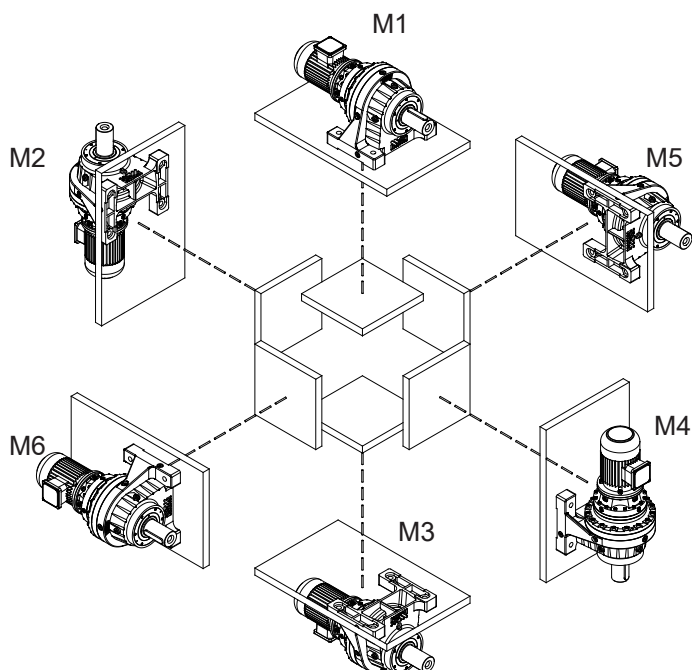
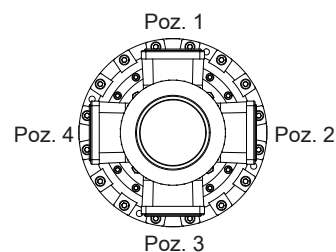
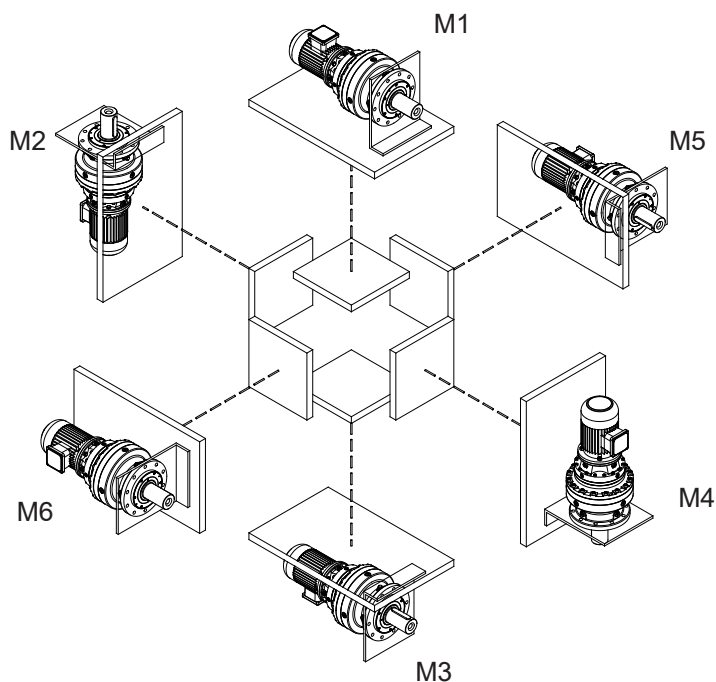
-Do not mix synthetic oils with mineral oils which will cause serious damage to the gear unit. The oil change must be done by using the filling, draining and level plugs according the mounting position illustrated in section 8.3.

- Extended, intensive contact with oils can lead to skin irritations. Avoid extended contact with oil, and clean oil off skin thoroughly.

- Hot oil can cause scalding. When changing oil, protect yourself against contacting hot oil.



8.3 Mounting Positions



Operating Instructions

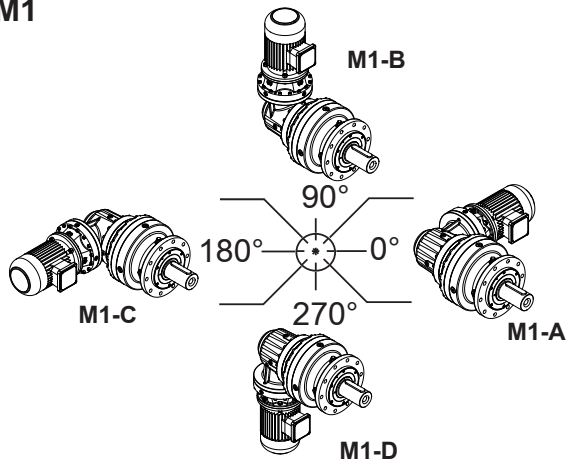
P Series

Lubrication

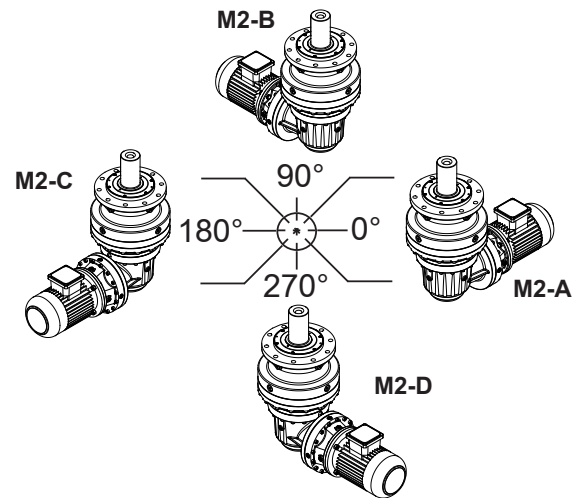


8.3.1 Mounting Position P Series with K Form

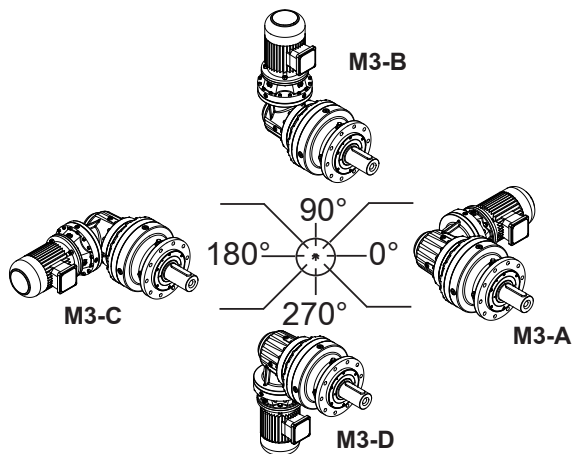
M1



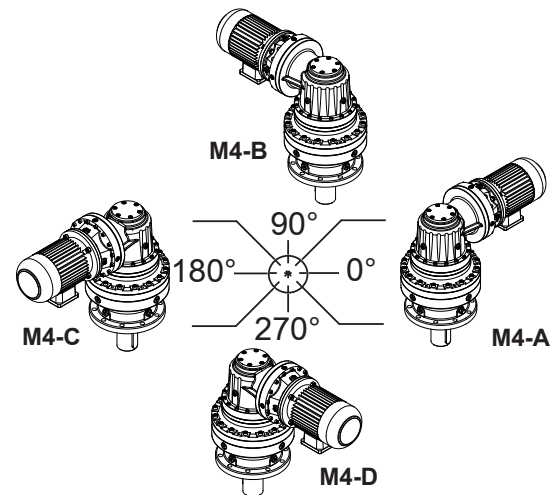
M2



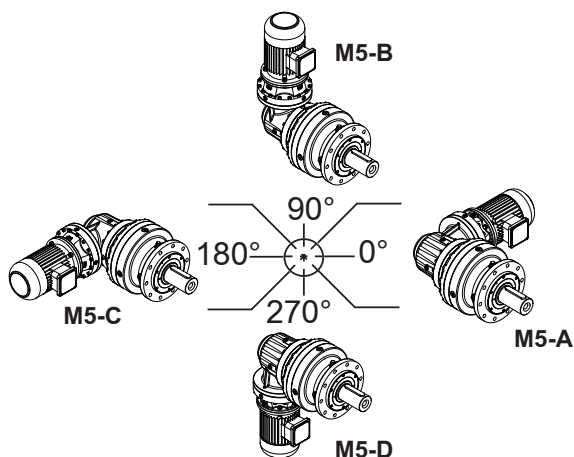
M3



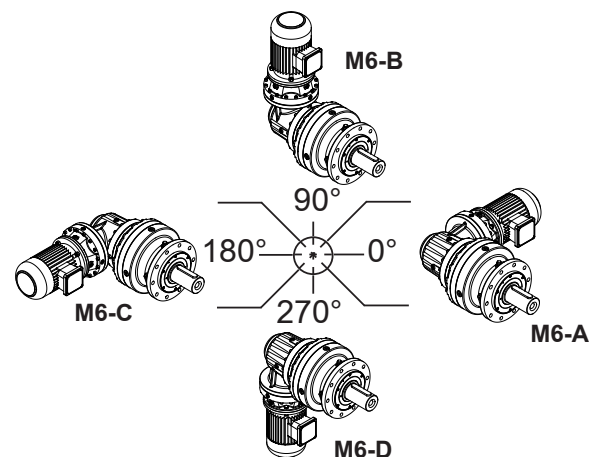
M4



M5



M6



Operating Instructions

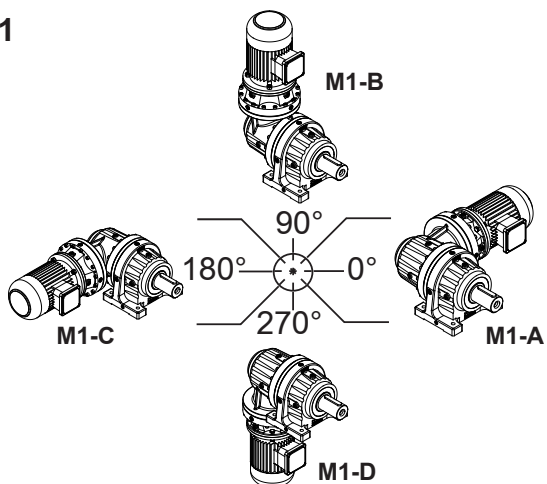
P Series

Lubrication

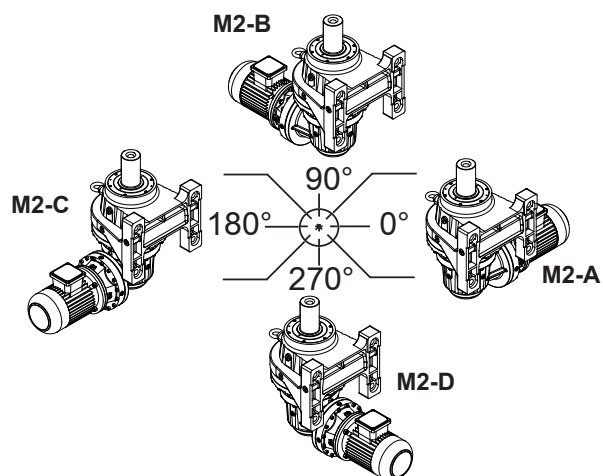


8.3.2 Mounting Positions R Series with K Form

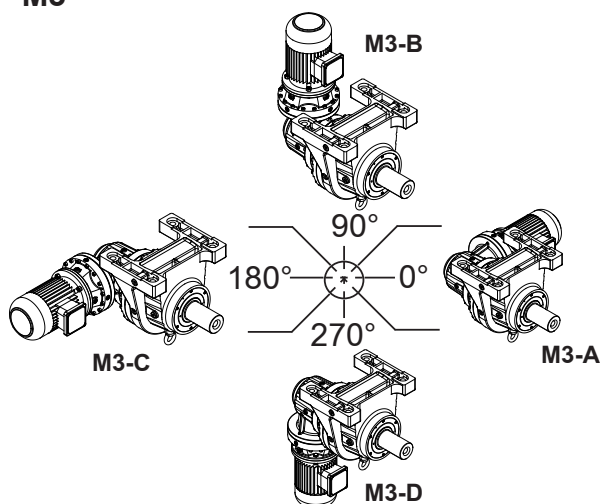
M1



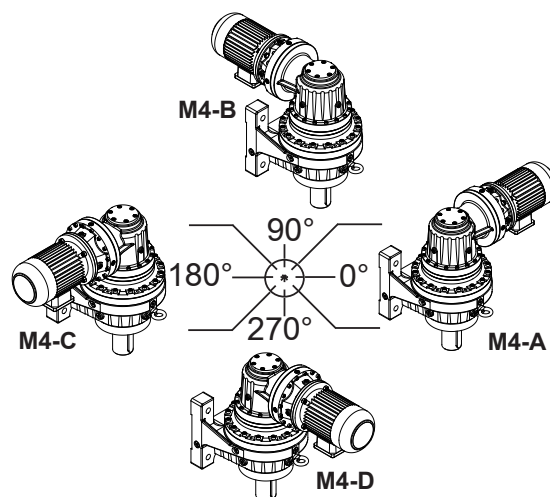
M2



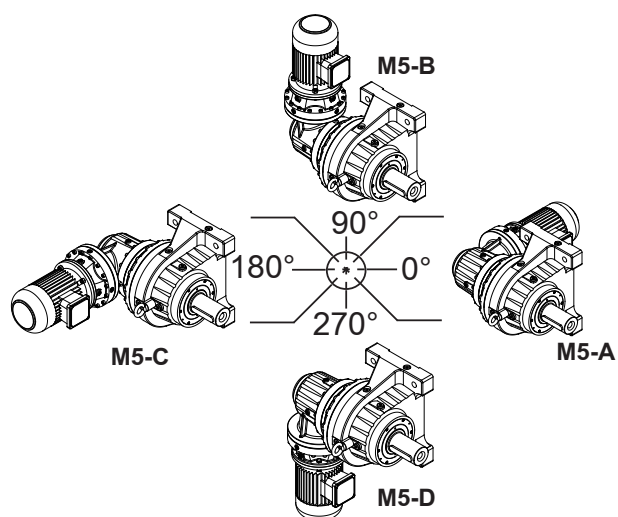
M3



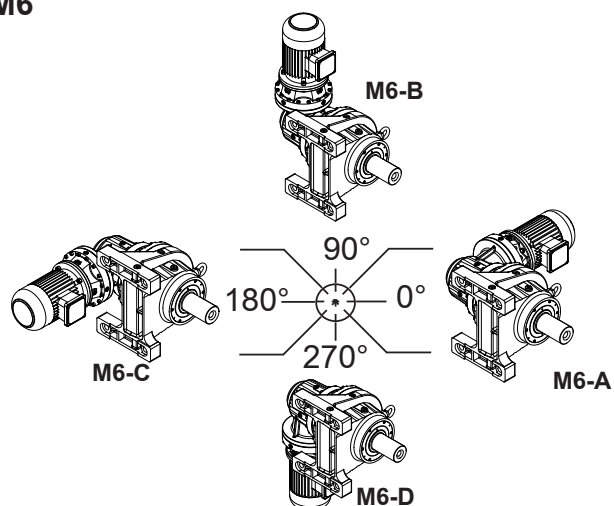
M4



M5



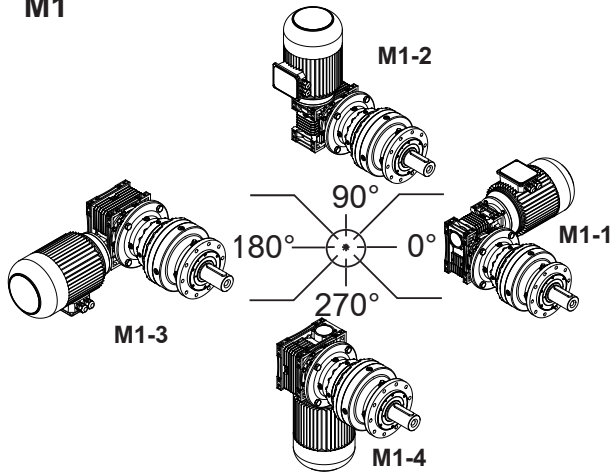
M6



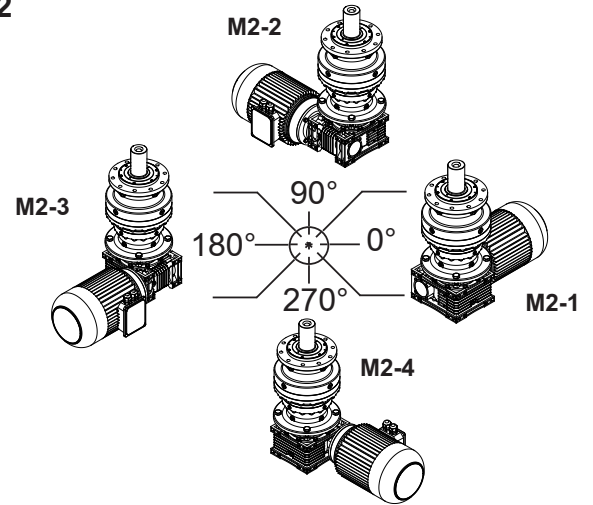


8.3.3 Mounting Position for P Series Combined with Worm Gear

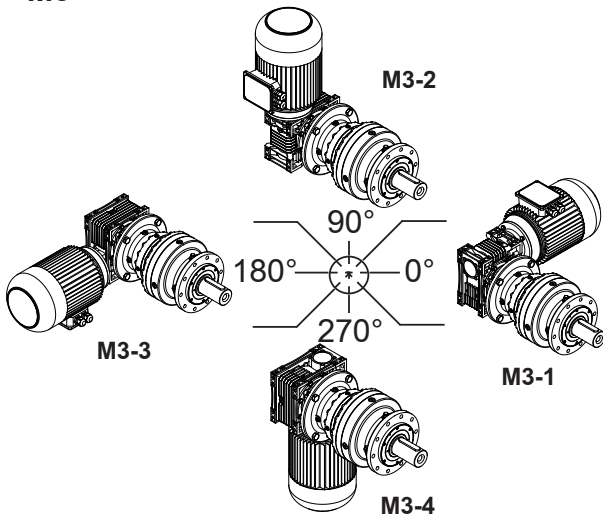
M1



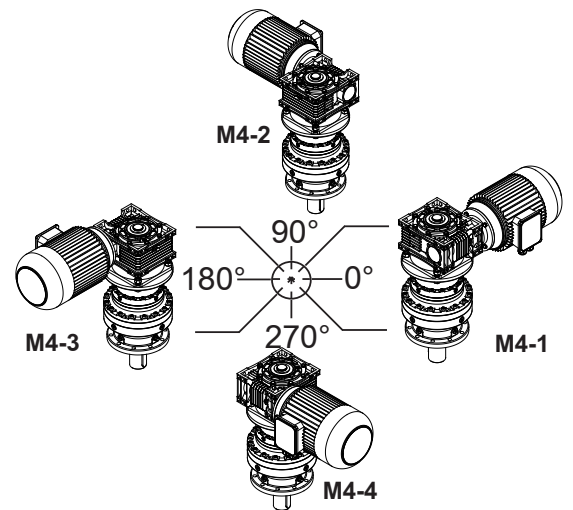
M2



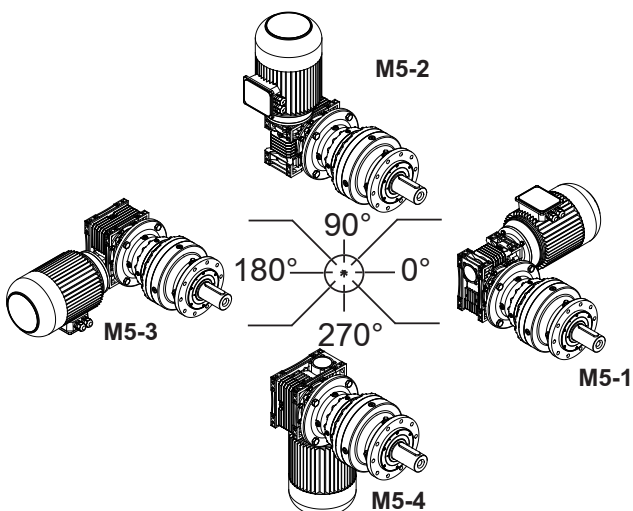
M3



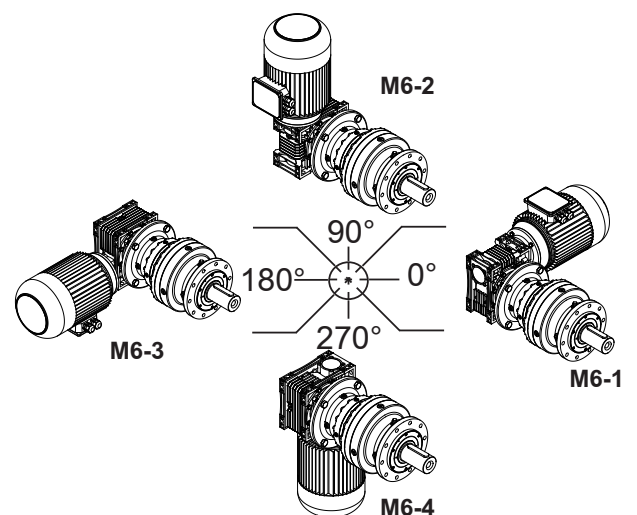
M4



M5



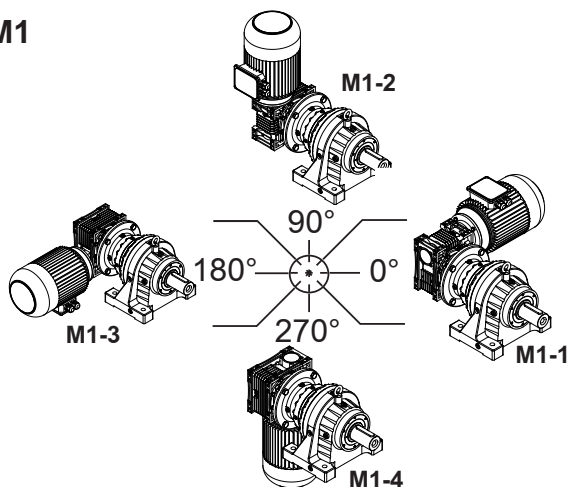
M6



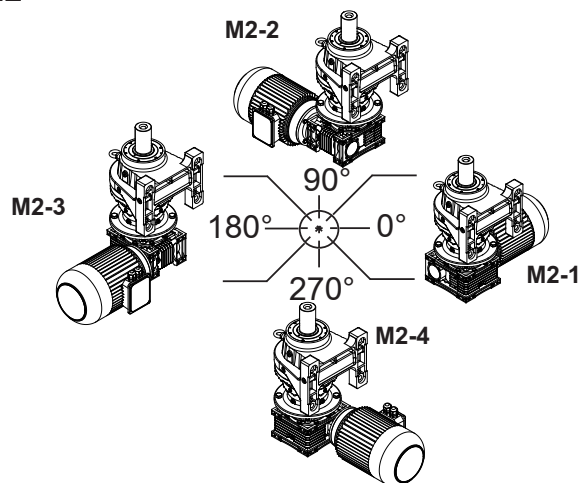


8.3.4 Mounting Position for R Series Combined with Worm Gear

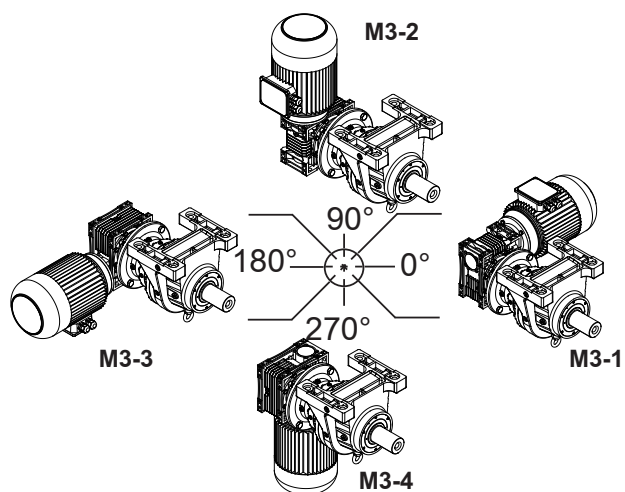
M1



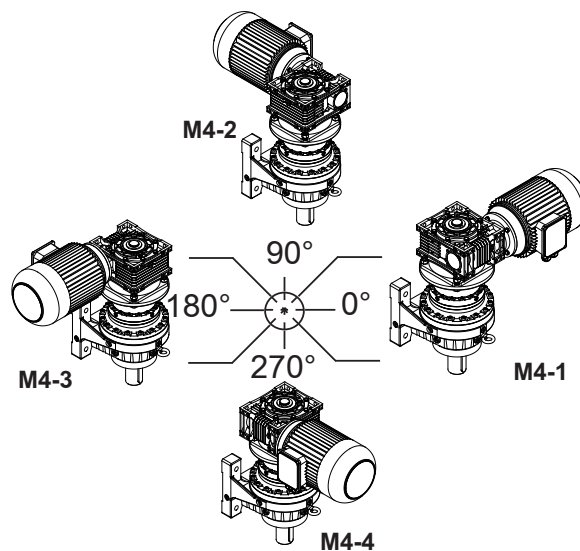
M2



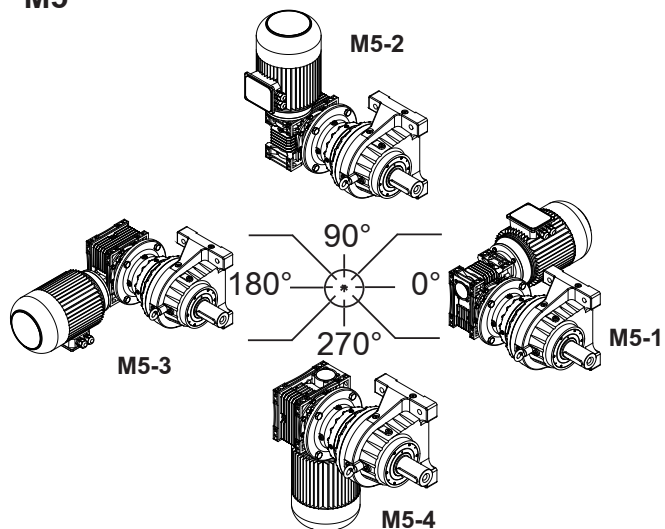
M3



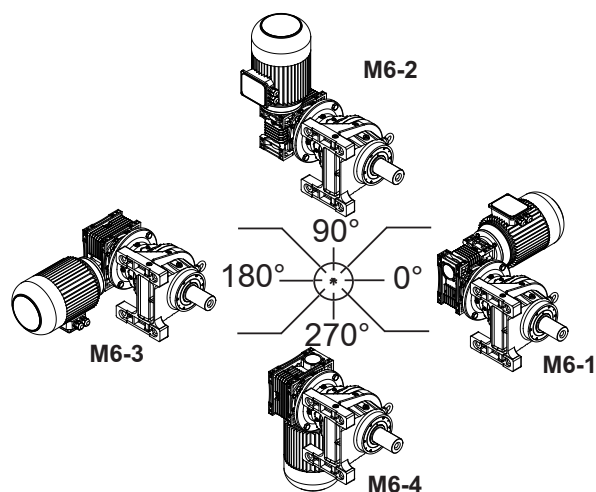
M4



M5



M6



Operating Instructions

P Series

Lubrication

8.4 Oil Quantities [liter]

Gearbox Type	Mounting position					
	M1	M2	M3	M4	M5	M6
P.1101L / R.1101L	0,6	0,6	0,6	0,8	0,6	0,6
P.1102L / R.1102L	0,7	1,2	0,7	1,3	0,7	0,7
P.1103L / R.1103L	1,1	1,8	1,1	1,6	1,1	1,1
P.1104L / R.1104L	1,4	2,1	1,4	2,2	1,4	1,4
P.1201L / R.1201L	0,7	0,7	0,7	0,9	0,7	0,7
P.1202L / R.1202L	0,8	1,3	0,8	0,9	0,8	0,8
P.1203L / R.1203L	1,5	2,0	1,5	1,8	1,5	1,5
P.1204L / R.1204L	1,5	2,3	1,5	2,4	1,5	1,5
P.1501L / R.1501L	1,4	2,8	1,4	1,7	1,4	1,4
P.1502L / R.1502L	1,3	1,9	1,3	2,1	1,3	1,3
P.1503L / R.1503L	1,5	2,4	1,5	2,6	1,5	1,5
P.1504L / R.1504L	1,8	3,0	1,8	3,1	1,8	1,8
P.1601L / R.1601L	1,5	3,0	1,5	1,9	1,5	1,5
P.1602L / R.1602L	1,5	2,1	1,5	2,2	1,5	1,5
P.1603L / R.1603L	1,8	2,6	1,8	2,8	1,8	1,8
P.1604L / R.1604L	2,0	3,0	2,0	3,2	2,0	2,0
P.1901L / R.1901L	2,2	2,4	2,2	2,2	2,2	2,2
P.1902L / R.1902L	2,0	2,9	2,0	3,3	2,0	2,0
P.1903L / R.1903L	1,8	2,1	1,8	3,1	1,8	1,8
P.1904L / R.1904L	2,0	2,5	2,0	3,5	2,0	2,0
P.2301L / R.2301L	3,6	4,2	3,6	4,2	3,6	3,6
P.2302L / R.2302L	4,3	4,2	4,3	7,2	4,3	4,3
P.2303L / R.2303L	3,4	3,7	3,4	6,4	3,4	3,4
P.2304L / R.2304L	3,6	4,2	3,6	6,8	3,6	3,6
P.2401L / R.2401L	4,0	4,9	4,0	4,5	4,0	4,0
P.2402L / R.2402L	4,5	4,4	4,5	7,4	4,5	4,5
P.2403L / R.2403L	3,5	4,0	3,5	6,5	3,5	3,5
P.2404L / R.2404L	4,0	4,4	4,0	7,0	4,0	4,0
P.2701L / R.2701L	5,0	9,0	5,0	8,6	5,0	5,0
P.2702L / R.2702L	4,7	8,3	4,7	7,1	4,7	4,7
P.2703L / R.2703L	4,6	9,0	4,6	6,7	4,6	4,6
P.2704L / R.2704L	4,7	8,5	4,7	8,5	4,7	4,7
P.2901L / R.2901L	5,75	8,3	5,75	9,65	5,75	5,75
P.2902L / R.2902L	6,05	11,15	6,05	7,55	6,05	6,05
P.2903L / R.2903L	6,1	8,8	6,1	10,35	6,1	6,1
P.2904L / R.2904L	6,2	8,7	6,2	11,75	6,2	6,2
P.3501L / R.3501L	6,5	7,6	6,5	10,7	6,5	6,5
P.3502L / R.3502L	7,4	14,0	7,4	8,0	7,4	7,4
P.3503L / R.3503L	7,6	8,6	7,6	14,0	7,6	7,6
P.3504L / R.3504L	7,7	8,9	7,7	15,0	7,7	7,7

Operating Instructions

P Series

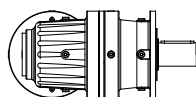
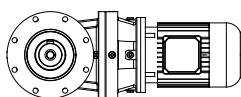
Lubrication



8.4 Oil Quantities [liter]

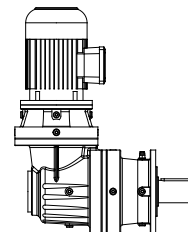
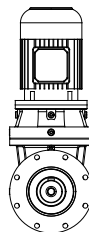
Gearbox Types	Mounting position					
	M1-A	M2-A	M3-A	M4-A	M5-A	M6-A
P.1102K / R.1102K	1,3	2,3	1,3	1,7	1,3	1,3
P.1103K / R.1103K	1,6	3	1,6	2,2	1,6	1,6
P.1104K / R.1104K	2,4	4,5	2,4	3,1	2,4	2,4
P.1202K / R.1202K	1,4	2,5	1,4	1,8	1,4	1,4
P.1203K / R.1203K	1,7	3,2	1,7	2,3	1,7	1,7
P.1204K / R.1204K	2,5	4,7	2,5	1,8	2,5	2,5
P.1502K / R.1502K	2,1	4,8	2,1	2,4	2,1	2,1
P.1503K / R.1503K	2	3,1	2	3	2	2
P.1504K / R.1504K	2	2,6	2	3,9	2	2
P.1602K / R.1602K	2,2	4,9	2,2	2,5	2,2	2,2
P.1603K / R.1603K	2,1	2,5	2,1	3,1	2,1	2,1
P.1604K / R.1604K	2,1	2,7	2,1	4	2,1	2,1
P.1902K / R.1902K	5	8,2	5	6,1	5	5
P.1903K / R.1903K	3,1	4,7	3,1	5	3,1	3,1
P.1904K / R.1904K	2,8	3	2,8	4,8	2,8	2,8
P.2302K / R.2302K	7,1	10,6	7,1	9,6	7,1	7,1
P.2303K / R.2303K	4,2	5,2	4,2	7,2	4,2	4,2
P.2304K / R.2304K	4,1	4,0	4,1	7,3	4,1	4,1
P.2402K / R.2402K	7,2	10,7	7,2	9,7	7,2	7,2
P.2403K / R.2403K	4,3	5,3	4,3	7,3	4,3	4,3
P.2404K / R.2404K	4,2	4,1	4,2	7,4	4,2	4,2
P.2702K / R.2702K	11	14,4	11	12,2	11	11
P.2703K / R.2703K	3,1	7,6	3,1	9	3,1	3,1
P.2704K / R.2704K	5,3	6,4	5,3	9,5	5,3	5,3
P.2902K / R.2902K	11,6	15,8	11,6	13,4	11,6	11,6
P.2903K / R.2903K	6,6	10,4	6,6	11,8	6,6	6,6
P.2904K / R.2904K	6,7	7,8	6,7	8,8	6,7	6,7
P.3502K / R.3502K	12,1	17,2	12,1	14,5	12,1	12,1
P.3503K / R.3503K	10,2	13,1	10,2	14,5	10,2	10,2
P.3504K / R.3504K	8,1	9,2	8,1	8,2	8,1	8,1

PV1501K.01



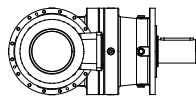
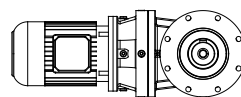
M1-A

PV1501K.01

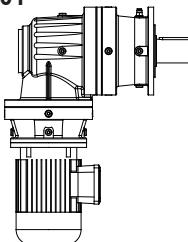
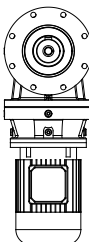


M1-B

PV1501K.01



PV1501K.01



Operating Instructions

P Series

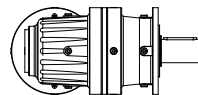
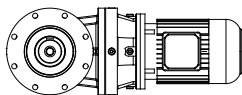
Lubrication



8.4 Oil Quantities [liter]

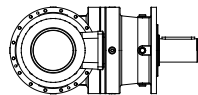
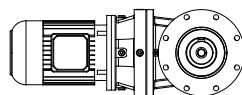
Gearbox	Mounting position					
	M1-B	M2-B	M3-B	M4-B	M5-B	M6-B
P...1102K / R...1102K	1	2,3	1,25	1,7	1	1
P...1103K / R...1103K	1,2	3	1,6	2,2	1,2	1,2
P...1104K / R...1104K	3,6	4,5	2,4	3,0	3,6	3,6
P...1202K / R...1202K	1,1	2,4	1,4	1,8	1,1	1,1
P...1203K / R...1203K	1,3	3,1	1,7	2,3	1,3	1,3
P...1204K / R...1204K	3,7	4,6	2,6	3,1	3,7	3,7
P...1502K / R...1502K	1,8	4,8	2,1	2,4	1,8	1,8
P...1503K / R...1503K	1,7	3,1	2	3	1,7	1,7
P...1504K / R...1504K	1,7	2,6	1,7	3,9	1,7	1,7
P...1602K / R...1602K	1,9	4,9	2,2	2,5	1,9	1,9
P...1603K / R...1603K	1,8	3,2	2,1	3,1	1,8	1,8
P...1604K / R...1604K	1,8	2,7	1,77	4,0	1,8	1,8
P...1902K / R...1902K	3,9	8,2	3,9	6,1	3,9	3,9
P...1903K / R...1903K	5,2	4,7	5,22	5	5,2	5,2
P...1904K / R...1904K	2,5	3	2,5	4,8	2,5	2,5
P...2302K / R...2302K	7,1	10,6	6,1	9,1	6,1	6,1
P...2303K / R...2303K	4	5,2	4,4	7,2	4	4
P...2304K / R...2304K	3,8	4,0	4,1	7,3	3,8	3,8
P...2402K / R...2402K	7,2	10,7	6,2	9,2	6,2	6,2
P...2403K / R...2403K	4,1	5,3	4,5	7,3	4,1	4,1
P...2404K / R...2404K	3,9	4,1	4,9	7,4	3,9	3,9
P...2702K / R...2702K	9,3	14,4	9,3	12,2	9,3	9,3
P...2703K / R...2703K	4,9	7,6	4,9	9,2	4,9	4,9
P...2704K / R...2704K	5	6,4	5,3	9,51	5	5
P...2902K / R...2902K	8	15,8	8	13,4	8	8
P...2903K / R...2903K	7,1	10,3	7,1	11,8	7,1	7,1
P...2904K / R...2904K	6,5	7,8	6,6	8,8	6,5	6,5
P...3502K / R...3502K	6,8	17,2	6,7	14,5	6,8	6,8
P...3503K / R...3503K	9,2	13,1	9,2	14,5	9,2	9,2
P...3504K / R...3504K	7,9	9,2	7,9	8,2	7,9	7,9

PV1501K.01

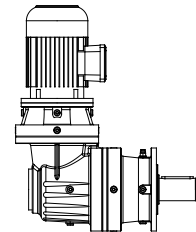
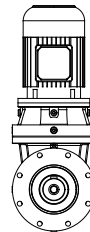


M1-A

PV1501K.01

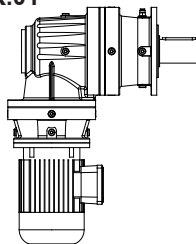
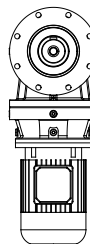


PV1501K.01



M1-B

PV1501K.01



Operating Instructions

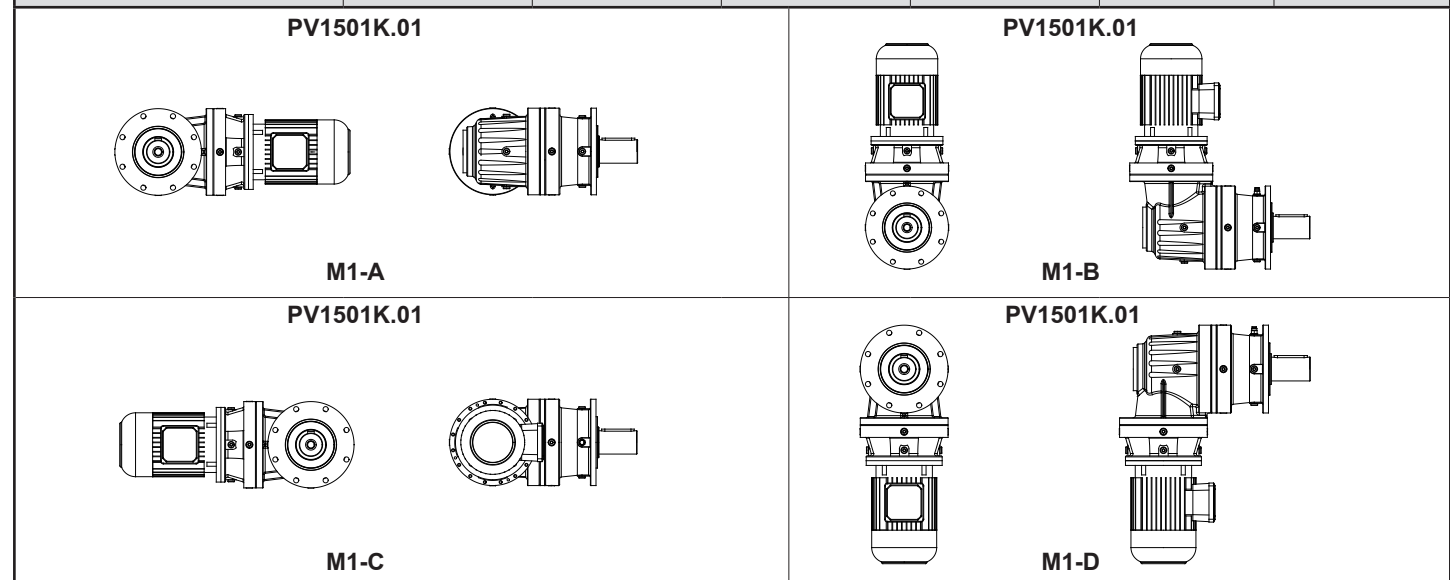
P Series

Lubrication



8.4 Oil Quantities [liter]

Gearbox	Mounting position					
	M1-C	M2-C	M3-C	M4-C	M5-C	M6-C
P...1102K / R...1102K	1,3	2,3	1,25	1,7	1,3	1,3
P...1103K / R...1103K	1,6	3	1,6	2,2	1,6	1,6
P...1104K / R...1104K	2,4	4,5	2,4	3,0	2,4	2,4
P...1202K / R...1202K	1,4	2,4	1,4	1,8	1,4	1,4
P...1203K / R...1203K	1,7	3,1	1,7	2,3	1,7	1,7
P...1204K / R...1204K	2,5	4,6	2,5	3,1	2,5	2,5
P...1502K / R...1502K	2,1	4,8	2,1	2,4	2,1	2,1
P...1503K / R...1503K	2	3,1	2	3	2	2
P...1504K / R...1504K	2	2,6	1,7	3,9	2	2
P...1602K / R...1602K	2,21	4,9	2,2	2,5	2,2	2,2
P...1603K / R...1603K	2,1	3,2	2,1	3,1	2,1	2,1
P...1604K / R...1604K	2,1	2,7	1,77	4,0	2,1	2,1
P...1902K / R...1902K	5	8,2	3,9	6,1	5	5
P...1903K / R...1903K	3,1	4,7	5,2	5	3,1	3,1
P...1904K / R...1904K	2,8	3	2,5	4,8	2,8	2,8
P...2302K / R...2302K	7,1	10,6	6,1	9,6	7,1	7,1
P...2303K / R...2303K	4	5,2	4,4	7,2	4	4
P...2304K / R...2304K	4,1	4,0	4,1	7,3	4,1	4,1
P...2402K / R...2402K	7,2	10,7	6,2	9,7	7,2	7,2
P...2403K / R...2403K	4,1	5,3	4,5	7,3	4,1	4,1
P...2404K / R...2404K	4,2	4,1	4,2	7,4	4,2	4,2
P...2702K / R...2702K	11	14,4	9,3	12,2	11	11
P...2703K / R...2703K	3,1	7,6	4,9	9,2	3,1	3,1
P...2704K / R...2704K	5,3	6,4	5,3	9,5	5,3	5,3
P...2902K / R...2902K	12,6	15,8	11,8	13,4	12,6	12,6
P...2903K / R...2903K	6,6	10,3	7,04	11,8	6,6	6,6
P...2904K / R...2904K	6,4	7,8	6,6	8,8	6,4	6,4
P...3502K / R...3502K	14,2	17,2	14,2	14,5	14,2	14,2
P...3503K / R...3503K	10,2	13,1	9,2	14,5	10,2	10,2
P...3504K / R...3504K	7,5	9,2	7,9	8,16	7,5	7,5





8.5 Oil Plugs

8.5.1 Oil Plugs for P Series L Type

Mounting position	Single Stage	2 Stages	3 Stages	4 Stages
M1				
M2				
M3				
M4				
M5				
M6				

Symbol :



:Drain Plug



:Oil Filling



:Oil Level



:Breather



8.5.2 Oil Plugs for R Series L Type

Mounting position	Single Stage	2 Stages	3 Stages	4 Stages
M1				
M2				
M3				
M4				
M5				
M6				

Symbol :

■ : Drain Plug

▽ : Oil Filling

▼ : Oil Level

● : Breather



8.5.3 Oil Plugs for P Series K Type

Mounting position	A	B	C	D
M1				
M2				
M3				
M4				
M5				
M6				

Symbol :

■ : Drain Plug

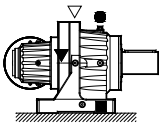
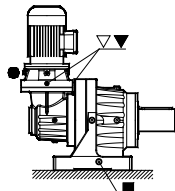
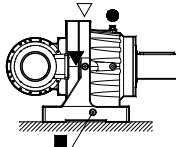
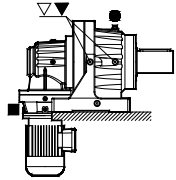
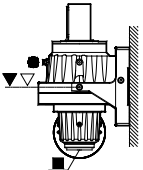
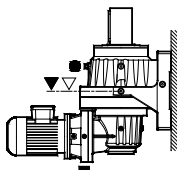
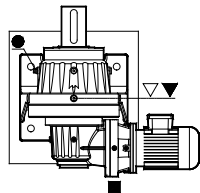
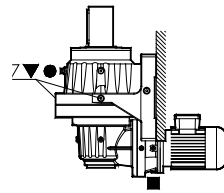
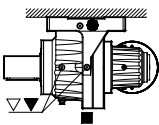
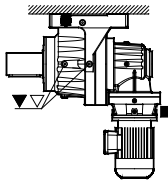
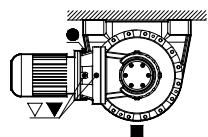
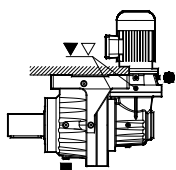
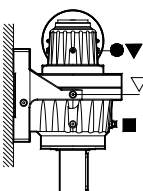
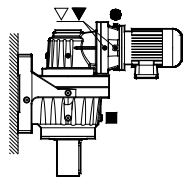
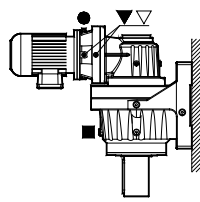
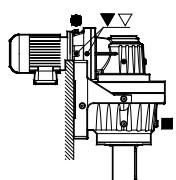
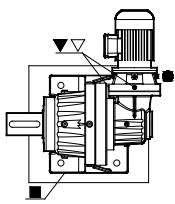
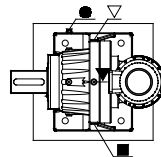
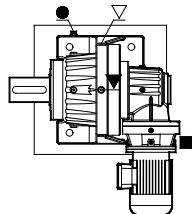
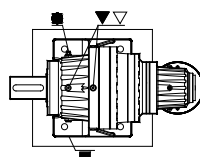
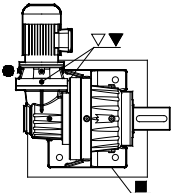
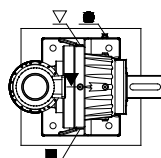
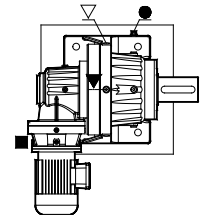
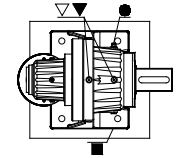
▽ : Oil Filling

▼ : Oil Level

● : Breather



8.5.4 Oil Plugs for R Series K Type

Mounting position	A	B	C	D
M1				
M2				
M3				
M4				
M5				
M6				

Symbol :



Drain Plug



Oil Filling



Oil Level



Breather

Operating Instructions

P Series

Lubrication



8.5.5 Oil Plugs for P Series Gearboxes Combined with E Series

Mounting position	1	2	3	4
M1				
M2				
M3				
M4				
M5				
M6				

Symbol : : Drain Plug

: Oil Filling

: Oil Level

: Breather

Operating Instructions

P Series

Lubrication



8.5.6 Oil Plugs for R Series Gearboxes Combined with E Series

Mounting position	1	2	3	4
M1				
M2				
M3				
M4				
M5				
M6				

Symbol :

■ :Drain Plug

▽ :Oil Filling

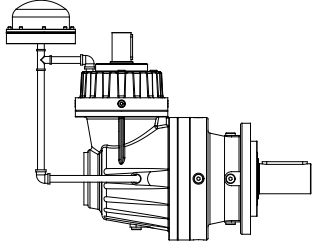
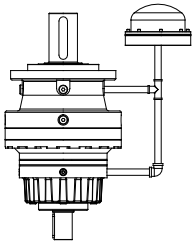
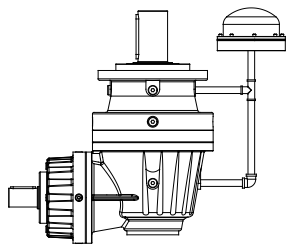
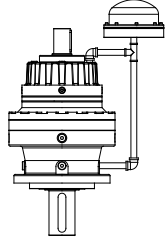
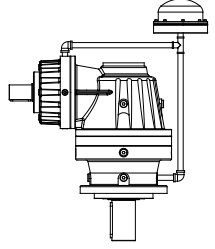
▼ :Oil Level

● :Breather



8.6 Oil Expansion Tank:

Expansion tanks can be used with Planetary gearboxes according to mounting positions shown on below.

Mounting Pos.	Expansion Tank (L Type)	Expansion Tank (K Type)
M1	Not Applicable	
M2		
M3	Not Applicable	Not Applicable
M4		



9- Troubleshooting Guide



All the operations bellow must be done by authorized and skilled mechanician / electrician. Inform YILMAZ REDUKTOR before making any change to the gearbox. Only oil change is allowed to change without information. Do not make anything if you are not sure what you are doing and contact YILMAZ. Any change or operation done without the information of YILMAZ REDUKTOR is in your own risk and responsibility and YILMAZ REDUKTOR does not take any responsibility.

ID	Problem	Observation	Remedy
001	Gearbox Does Not Start Up	You hear no noise and shaft is not turning. You are not using any driver or frequency inverter.	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Still does not work go to ID 100
002	Gearbox Does Not Start Up	You hear no noise and shaft is not turning. You are using frequency inverter or driver.	Please observe the frequency inverter/driver manual. Check the motor by supplying direct voltage to see if the problem is on your driver/frequency inverter. Still does not work go to ID 001.
003	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are not using any driver / frequency inverter or braked motor.	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Still same problem, the load may be too high for the chosen motor. Loosen the gearbox from the load/torque. If it works than the starting torque is insufficient and higher motor power is needed. For monophaze motors, check the starting up compensator and running condensate as well. If nothing helps go to ID 100
004	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are using driver or frequency inverter.	Please observe the frequency inverters or drivers manual. To see if the problem is on your driver or frequency inverter take out the driver/frequency inverter and make direct voltage supply to the motor according the motors nameplate. Still does not work go to ID 100
005	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are using braked motor	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Be sure that the brake is working. Observe the brake manufacturers manuel. If brake is supplied from YILMAZ observe this manuel for correct brake wiring diagram. If still not work supply the brake with voltage according its nameplate directly. For example 198V DC. You will hear a clicking noise explaining that the brake is opening. If you hear no noise the brake or rectifier is defect. If you hear the clicking noise the brake is working. You should this clicking noise by your normal electric connection as well. By supplying direct supply to the brake you hear the clicking noise and at same time you supply the motor with direct voltage according to its name plate and still same problem, the load may be too high for the chosen motor. Go to ID 003.

Operating Instructions

P Series

Troubleshooting Guide



ID	Problem	Observation	Remedy
006	Gearbox Does Not Work in Low Speeds/frequencies.	You are using frequency inverter.	For very low speeds the frequency inverter's frequency is lowering down. For very low frequencies the inverter parameter and motor parameter must be optimized. Also for low speeds the efficiency of the gearbox may vary too much. Specially for worm-gearboxes. The recommended frequency range is 20-70 Hz for worm-gearboxes and 10-70 Hz for Helical Gear Boxes. Use Higher motor power and Frequency inverter or change ratio of gearbox to work inside the recommended range.
007	Gearbox Does Not Start Mornings or After Long Time Stop.	Ambient Temperature is below +5 Celsius	The oil is not in accordance with your working conditions. Change to lower viscosity oils. Observe this manual for using the correct oil. Working in higher ambient temperatures is another solution if possible. If still same problem you need higher motor power.
008	Gearbox is Heating too Much Up	You are using Worm Gear Box and ambient temp is lower than +40 Celsius	Measure the surface temp. using a temperature measuring device under full load. If the temp is under +80 Celsius this will make no harm to the gearbox and is normal. All ATEX conforming gearboxes and standard worm gearboxes are designed to work under max. +120 Celsius. <u>If higher than +120 Celsius and using ATEX conforming gear box immediately stop the system and contact YILMAZ REDUKTOR.</u> Go to ID 100. If not ATEX conforming check the oil type and oil quantity/level according your mounting position and check the nameplate mounting position. If nameplate mounting position does not fit the actual position go to ID 100.
009	Gearbox is Heating too Much Up	You are using Helical Gear Box. Ambient temp is lower than +40 Celsius	Measure the surface temp. using a temperature measuring device under full load. If the temp is under +80 Celsius this will make no harm to the gearbox and is normal. All ATEX conforming gearboxes are designed to work under max. +120 Celsius. <u>If higher than +120 Celsius and using ATEX conforming gear box immediately stop the system and contact YILMAZ REDUKTOR.</u> If not ATEX gearbox the gearbox is designed to work under max. +80 Celsius. If higher than +80 Celsius check the oil type and oil quantity/level according your mounting position and check the nameplate mounting position. If nameplate mounting position does not fit the actual position go to ID 100
010	Gearbox is Heating too Much Up	Ambient Temp is over +40 Celsius	Standard Gearboxes are designed to work under +40 Celsius. ambient temperature. If ambient temp is higher than +40 Celsius special solutions/gearboxes are required. Please contact YILMAZ
011	Gearbox is noisy	Noise is regular continuous	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you still hear the noise motor bearings or gearbox bearings are defect. Change bearings. Go to ID 100
012	Gearbox is noisy	Noise is random	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you hear still the noise the oil may have some particles inside. Change the oil and look for small particles. If metal particles are found the gearbox may have some damage. Go to ID 100

Operating Instructions

P Series

Troubleshooting Guide



ID	Problem	Observation	Remedy
013	Gearbox is noisy	Regular knocking noise	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you still hear the noise one of the gears inside is defect. Go to ID 100
014	Gearbox is noisy	Regular up and down noise	Check the output-shaft connection elements for run out. Take out the output shaft element and run without load. If you still hear the noise one of the gears has run out problem. Go to ID 100
015	Gearbox is noisy	Gearbox is with braked motor and noise is coming from the brake side randomly.	Low randomly clicking noise may come from the brake disc which is normal. If noise level is disturbing the brake may be defect or brake clearance is not adjusted. Go to ID 100
016	Gearbox is noisy	You are using frequency inverter and the noise level is changing according your speed.	The frequency inverter parameters are not optimized for the frequency range or motor you are using. Observe the frequency inverters manual. If still same problem change the ratio of gearbox. Go to ID 100
017	Oil is Leaking	Oil Leakage from Seal	If ambient Temp is over +40 Celsius or none stop work over 16 hours please change the top plug with a breather plug. Observe this manual for using breather plug. If this is not your case the seal could be damaged. Go to ID 100
018	Oil is Leaking	Oil Leakage from Plug	If you are using breather plug be sure it is in the correct place. This is the most top plug position according your mounting position. The plug may be not tight enough. There are some particles under the plug rubber surface. Clean and tighten the plug. If still same problem go to ID 100
019	Oil is Leaking	Oil Leakage from Housing	Observe exactly where the oil is coming out. It could be seal or plug point where it comes out and leaks over the housing. If this is your case goto ID 018/019. If you are sure oil comes out from housing than housing has some micro split / crack. Go to ID 100
020	Oil is Leaking	Oil Leakage from Cover	The sealing liquid under cover is split/defect. Disassemble the cover and put new sealing liquid. Assemble the cover and tighten the bolts. If still same problem go to ID 100
021	Gearbox is moving regularly on its mounting point	You are using Torque Arm	The movement of gear box is because of the run out of the shaft which you assemble the gearbox. This has no bad affect or harm to the gearbox and is normal unless you are using torque arm.
022	Gearbox is moving randomly on its mounting point	You are using Torque Arm	The movement of gear box is because of the run out and clearance of the shaft which you assemble the gearbox. Check the clearance of the assembling shaft and the clearances on your machine. This has no bad affect or harm to the gearbox unless you are using torque arm.
023	Motor is heating up	Motor is running over its nominal current	The motor power is not enough or some overload to the motor is possible. The motor may be defect. Go to ID 100
023	Motor is heating up	Ambient is dusty	Check the motor Fan Hub and ribs. They must be free of dust. If you are using forced external fan, check if it is working. If you are using frequency inverter in low speeds and you do not have forced external fan, you may need forced external fan. Go to ID 100

Operating Instructions

P Series

Troubleshooting Guide



ID	Problem	Observation	Remedy
024	Motor is running but Gear-box shaft does not turn	Scratching noise comes out	Some part (key, gear) may be defect inside gearbox. Go to ID 10
025	Gearbox Housing is Defect	You are using chain drive or pinion gear	The radial load or polygon effect of the chain may have caused the damage. Check also if the assembly bolts are loosened or the plate you assemble the gearbox is rigid enough. Check if you are using the correct diameter of chain drive and you are not exceeding max. Allowed radial load. Check the position of your output element and re-calculate your radial load and check if this fit to the maximum allowed radial load. Go to ID 100
026	Output Shaft is Defect	You are using chain drive or pinion gear	The radial load or polygon effect of the chain may have caused the damage. Check also if the assembly bolts are loosened or the plate you assemble the gearbox is rigid enough. Check if you are using the correct diameter of chain drive and you are not exceeding max. allowed radial load. Check the position of your output element and re-calculate your overhung load and check if this fit to the maximum allowed load. Go to ID 100
027	Gearbox is stopping too late	You are using braked motor	Please check the wiring diagram of the brake. There are two different kind of brake wiring diagram. The standard gearbox delivered from our factory is set to delayed braking. For sudden braking check the wiring diagram.
028	Gearbox is starting too late	You are using braked motor	For fast opening of big brakes (over 100Nm), you may need shock transformers which is supplied by YILMAZ. Go to ID 100
100	Service Required	No self solution found	Please contact YILMAZ REDUKTOR Service point. See on the back side of this manual. Changing mechanical parts of gearbox can only be done by YILMAZ REDUKTOR or with information of YILMAZ REDUKTOR. Any change without informing YILMAZ REDUKTOR will cancel the warranty, manufacturer declaration and YILMAZ REDUKTOR will take no responsibility.

Appendix



Warranty Conditions:

1. The geared motors and gear units are warranted for two year except the electric motor. For motor warranty please refer to the manual of the electric motor manufacturer or the warranty document of the motor manufacturer. This warranty is valid only if the gearbox is assembled and started up according our operating instructions and is used under the allowed conditions for the appropriate gearbox type in our catalogue.
2. The warranty time starts from the start up time written on the warranty document and last for two years. If the start-up time is more then three months after the billing time, the total warranty time is limited to 27 months starting from billing time. If the warranty document is not send to our company after start-up, the total warranty time will be limited to 24 months after the billing time.
3. Any time during the warranty for maintenance, repair or change will be added to the warranty time. This time starts from the date which the company or representative was made aware of the problem and ends on the date of the re-start-up.
4. If the product fails to operate because of a manufacturing or assembly failure during the warranty time, the product will be repaired free of charge.
5. If the product fails to operate because of a manufacturing or assembly failure during the warranty time and it is not possible to repair it, the product will be changed with a new one according to the report from our service department mentioning that the hazard can not be repaired.
6. Costumers must inform the manufacturer if there are some problems after the service and repair of the failed product.
7. The extra costs like stopped plant, physical or mental injuries etc. by the costumer side are not covered by this warranty except the product itself.

YILMAZ REDUKTOR San. ve Tic. A.S.

Head Office: Maltepe Gumussuyu Cad. Bestekar Medeni Aziz Efendi Sok. No:54
P.K.34020 Topkapi/Istanbul-TURKEY

Phone: +90 (0) 212 567 93 82/83 , Fax: +90 (0) 212 567 99 75

Factory : YILMAZ REDUKTOR Sanayi ve Ticaret A.S.

ATATÜRK Mah. Lozan Cad. No:17 P.K.34522 Esenyurt-İstanbul- TURKİYE

Telephone: +90 (0) 212 886 90 01 (8 line) , Fax: +90 (0) 212 886 54 57



Warranty Declaration and Instruction Manual Receipt Form

YILMAZ REDUKTOR products are warranted for **2 (Two)** years covering all parts and materials used in products and their production errors unless they are started-up and used according our service manual and is not modified or disassembled without an acknowledgement from our company.

The warranty covers all costs like repair, service, spare parts etc. and no charge will be asked under any name. The time for repair, service will be added to the warranty time.

For detailed warranty conditions please refer the back side of this page.

Serial No:

Type:

Manufacturer:

Company : YILMAZ REDUKTOR Sanayi ve Ticaret A.S.

Address : ATATÜRK Mah. Lozan Cad. No:17 P.K.34522 Esenyurt-Istanbul- TURKIYE

Telephone : +90 (0) 212 886 90 01 (8 line)

Fax : +90 (0) 212 886 54 57

Stamp and Signature

Supplier / End User:

With signing this part and sending this back to our company your warranty period will be started and you are accepting that you have received the operating instruction of the product.

Name:

Billing Date/ Bill No.:

Start-Up Place / Date:

Address:

Phone - Fax:

Supplier/ End User Stamp and Signature

Service Contact Points:

Main Service Point:

YILMAZ REDUKTOR A.S.

ATATÜRK Mah. Lozan Cad. No:17 P.K.34522 Esenyurt-İstanbul- TURKİYE

Telephone: +90 (0) 212 886 90 01 - 6 lines , Fax: +90 (0) 212 886 54 57

Head Office:

Tel: +90 (0)212 567 93 82 (2 line),

+90(0) 212 567 06 03,

+90(0) 212 567 40 78

+90(0) 212 567 04 11

+90(0) 212 567 45 07

+90(0) 212 567 00 70

Fax: +90(0) 212 567 99 75

e-mail: yilmaz@yr.com.tr

web: www.yr.com.tr

Factory:

Tel: +90(0) 212 886 90 01 (8 line)

+90(0) 212 886 50 43

+90(0) 212 886 50 44

+90(0) 212 886 52 82

Fax: +90 (0) 212 886 54 57

e-mail: yilmaz@yr.com.tr

web: www.yr.com.tr

Outside Turkey:

Please contact the main service point mentioned above. You will be directed to our nearest service point to your location