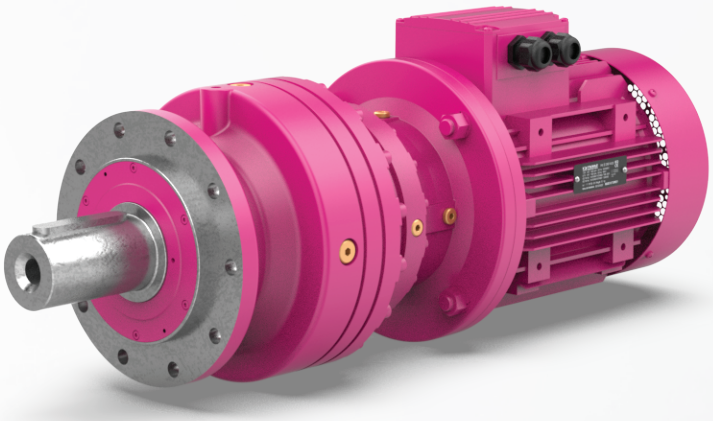
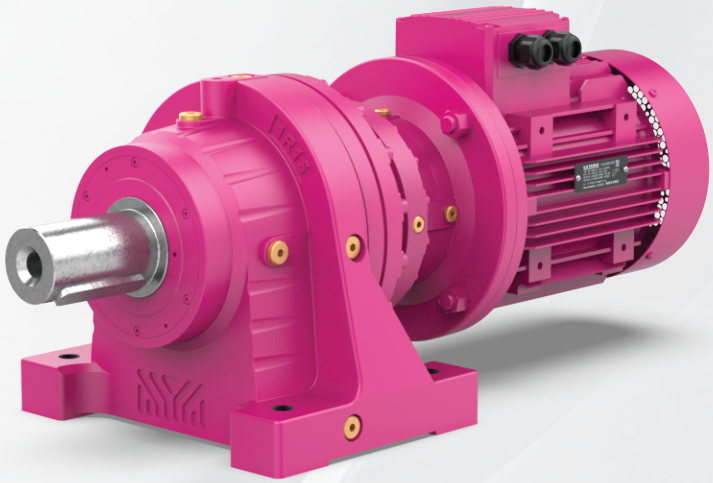
YILMAZ REDÜKTÖR ISO 9001

OPERATING INSTRUCTIONS

P Series



R Series



YILMAZ REDÜKTÖR

OIPCE0200-0125

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1- How To Use This Manual

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


Electric 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 drive or environment


Important Information


EC Machinery Directive:
Within terms of the EC machinery directive 2006/42/EC, the gear reducer is not considered an autonomous machine, but as a component to install in machines.
Operation is prohibited within the area of validity of the 2006/42/EC directive, until it has been determined that the machine, in which this product is installed, corresponds to the regulations within this directive.


The machine manufacturer or user is responsible for taking the necessary precautions on the machine or at the place where the gearbox will be used, in order to prevent injury and life-threatening risks by taking into account the shaft, gear failures etc. that may occur in the gearboxes.

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/R Series gear units and is applicable only for P/R Series. If any different type of gearbox is used please ask YILMAZ REDUKTOR for the operating instructions of that type.

This instruction can be used only for standard type geared units of YILMAZ REDUKTOR. For special application and modified gear units ask YILMAZ REDUKTOR for validity.

This manual does not cover 2014/34/EU (ATEX) compatible gearboxes. For 2014/34/EU contact YILMAZ REDUKTOR.

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

1	2	3	4	5	6	7	8

Serie of Gearbox:
P.....: Planetary Gearbox with Flange Mounted.
R.....: Planetary Gearbox with Foot Mounted.

Version of Gearbox:
V : With Electric or Hydraulic Motor
N : Motor Connection Flange (IEC, C26, M46)
T : Solid Input Shaft
VB : IEC B5 / B14 Flanged Drywell Gearbox with Motor
NB : IEC B5 / B14 Flanged Drywell Gearbox without Motor
TB : Drywell Gearbox Without Motor

Gearbox Sizes:
11, 12, 15, 16, 19, 23, 24, 27, 29, 35, 37, 39, 41

Revision Number

Number of Stage:
1.....: Single Stage
2.....: Two Stage
3.....: Three Stages
4.....: Four Stages

Shaft Condition:
L: Input and Output Shafts on Same Axis
K: Input and Output Shafts Perpendicular

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

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

- If the gearbox unit is PN, RN Type:

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
A28	280 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:

3E90S/4
- Number of pole
- Frame length
- Motor size (71...-280...)
- Motor brand
- Motor efficiency class

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

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

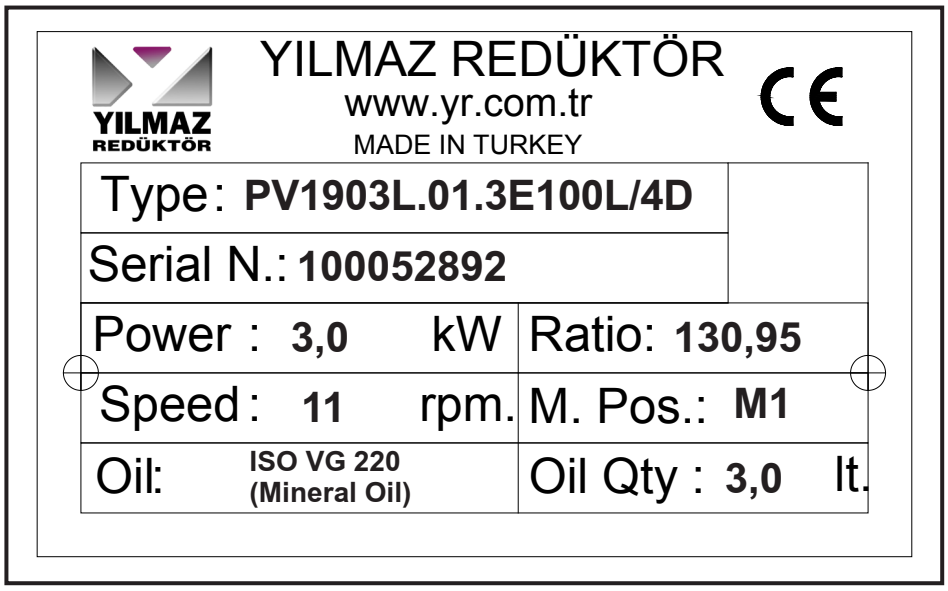
Examples

PT1202K.01
Without motor, solid output shaft, gearbox size 12, 2 stages, perpendicular input and output shaft with flange
PV1902L.01-3E160M/6
11 kW 900 rpm IE3 efficiency Elk brand motor, solid output shaft, gearbox size 19, 2 stages, parallel input and output shaft with flange
RV1502L.00-2E90S/6A
0,75 kW 900 rpm IE2 efficiency Elk brand motor, hollow output shaft, gearbox size 15, 2 stages, parallel input and output shaft, with foot
PN1102L.01-EV063-3E71M/4D
0,37 kW 1400 rpm IE3 efficiency Elk brand motor, 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/R Series



Abbreviations:
Serial N. : Serial Number
M.Position. : Mounting Position

Type Designation

PV1903 L.01.3E100L/4D

Type

Motor Type

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 Arrangement
L : Input and Output shafts are on same axis
K : Input and Output shafts are perpendicular each other.

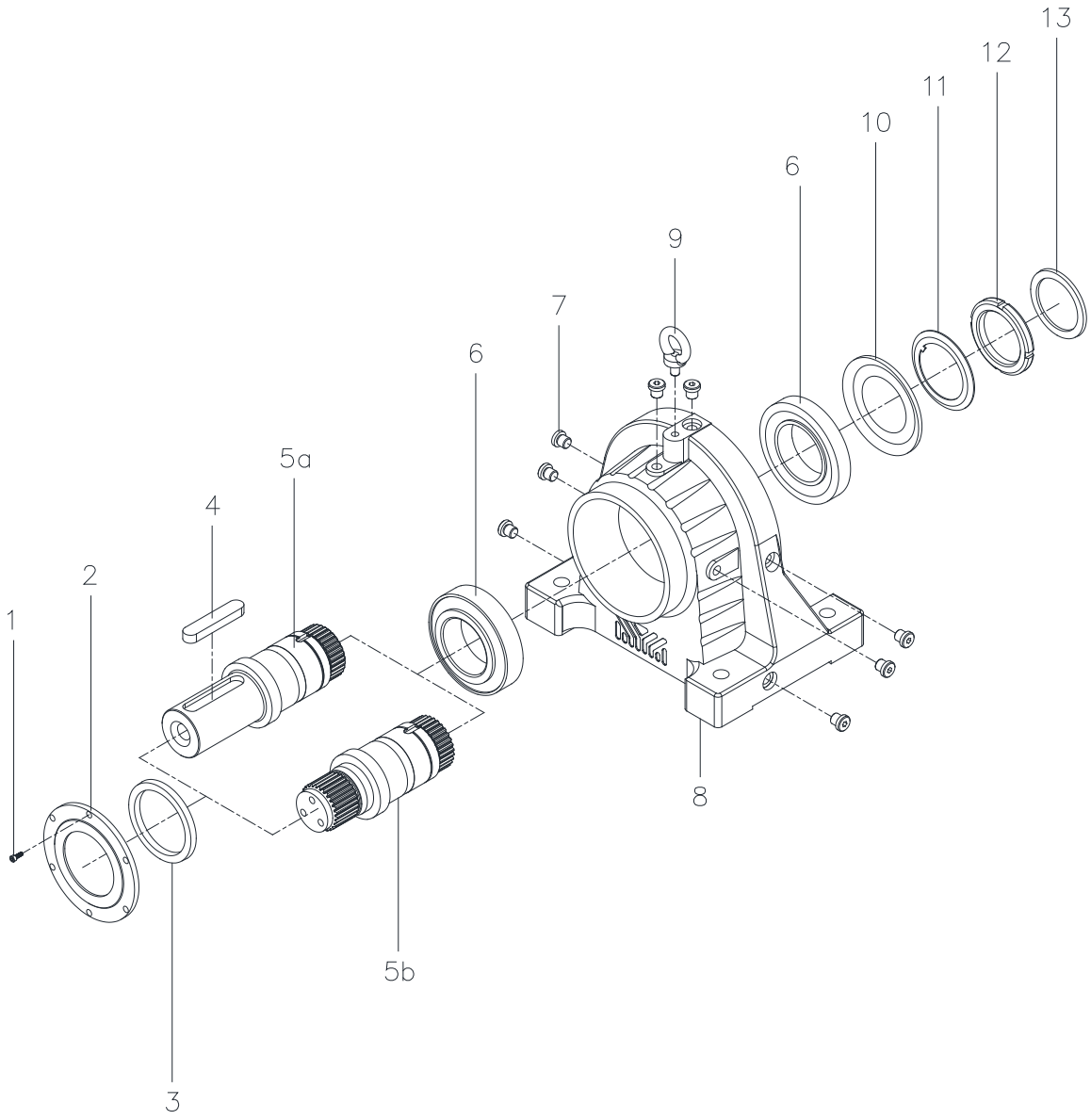
3- Standard Type Gearbox Part List

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 / 37

Output Type :01 / 1K / 1L

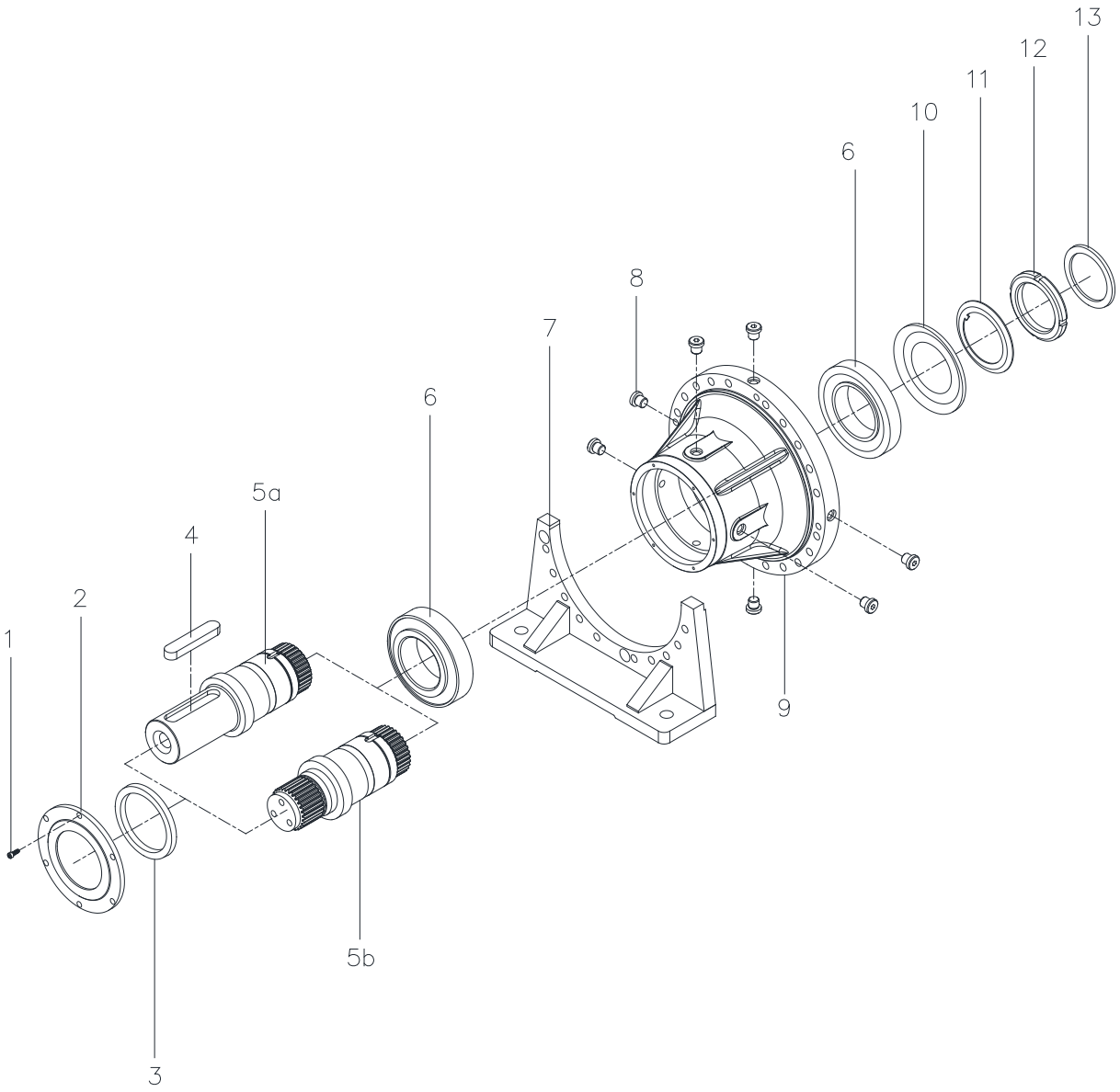


Parts may differ for special applications.

Standard Part List

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

3.1.2- Version of Gearbox : RV / RN / RT
Gear Size : 39
Output Type :01 / 1K / 1L

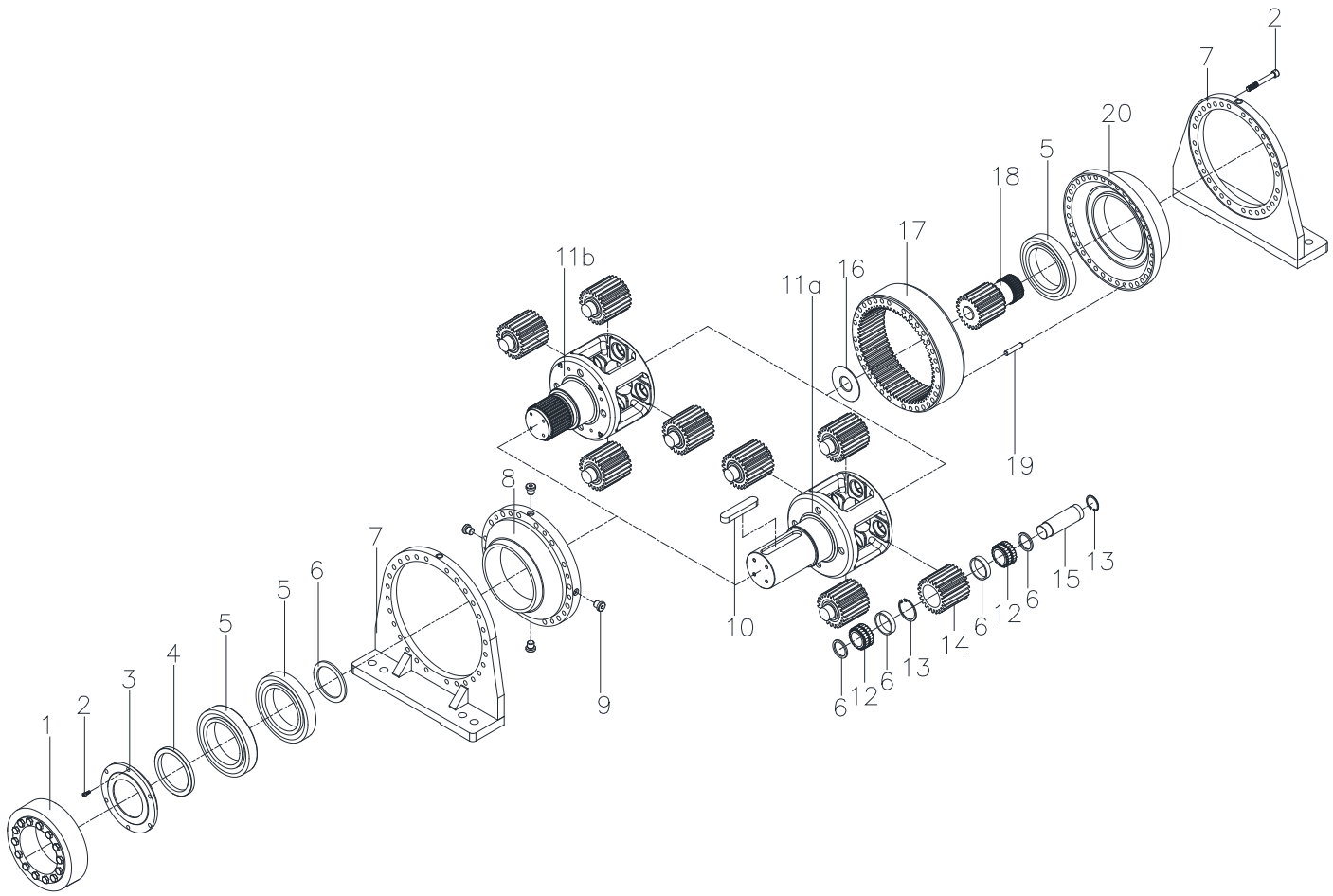


Parts may differ for special applications.

Standard Part List

1- Bolt	5b- Splined Solid Output Shaft	10- Nilos Ring
2- Seal Cover	6- Bearing	11- Tab washer
3- Seal	7- Steel Foot	12- Locknuts
4- Key	8- Oil Plug	13- Spacer
5a- Output Shaft	9- Output Flange	

3.1.3- **Version of Gearbox :** RV / RN / RT
Gear Size **:** 41
Output Type :01 / 1K / 1L

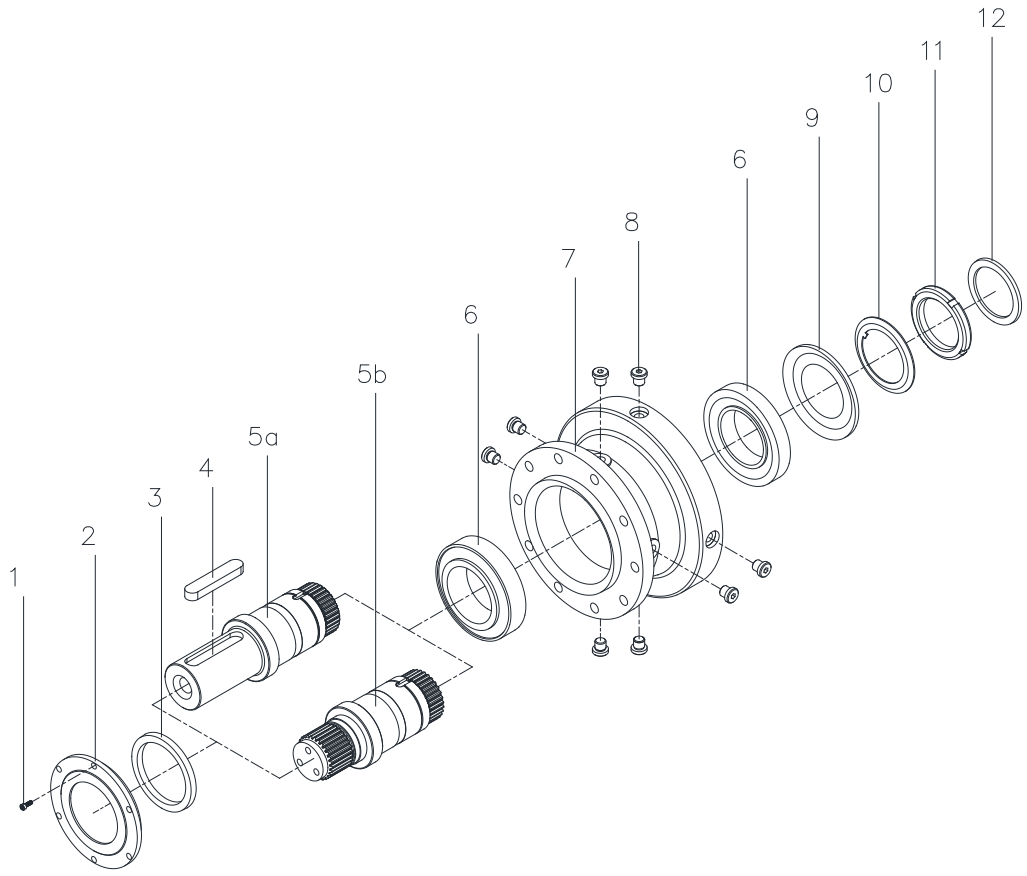


Parts may differ for special applications.

Standard Part List

1- Shrink Disc	6- Spacer	11a- Output Shaft with Carrier	15- Pin	20- Flange
2- Bolt	7- Steel Foot	11b- Splined Solid Output Shaft with Carrier	16- Washer	
3- Seal Cover	8- Output Flange	12- Neddle Roller and Cage	17- Internal Gear	
4- Seal	9- Oil Plug	13- Circlip	18- Sun Gear	
5- Bearing	10- Key	14- Planetary Gear	19- Pin	

3.1.4- Version of Gearbox : PV / PN / PT
Gear Size :11 / 12 / 15 / 16 / 19 / 23 / 24
Output Type :01 / 1K / 1L

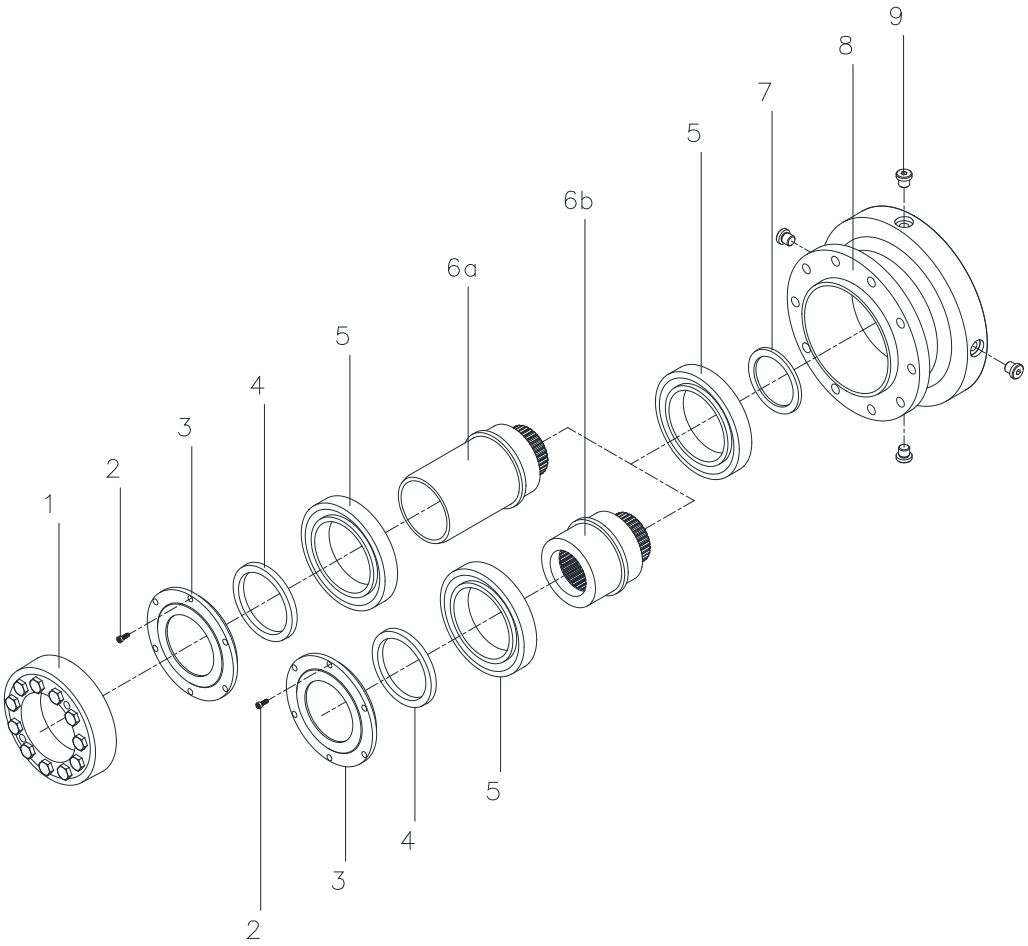


Parts may differ for special applications.

Standard Part List

1- Bolt	5b- Splined Solid Output Shaft	10- Tab washer
2- Seal Cover	6- Bearing	11- Locknuts
3- Seal	7- Output Flange	12- Spacer
4- Key	8- Oil Plug	
5a- Output Shaft	9- Nilos Ring	

3.1.5- Version of Gearbox : PV / PN / PT
Gear Size :11 / 12 / 15 / 16 / 19 / 23 / 24
Output Type :0S / 0K / 0L

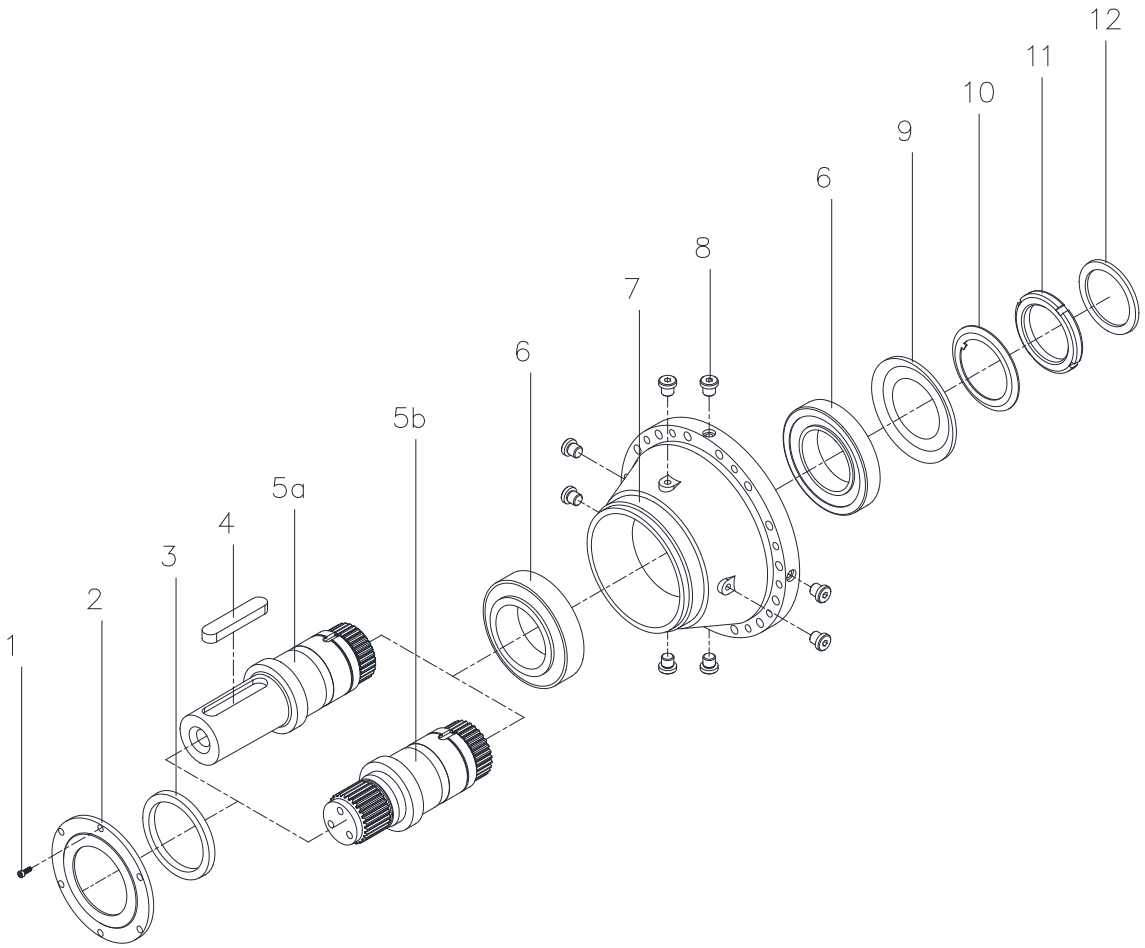


Parts may differ for special applications.

Standard Part List

1- Shrink Disc	6a- Hollow Shaft
2- Bolt	6b- Splined Hollow Shaft
3- Seal Cover	7- Spacer
4- Seal	8- Output Flange
5- Bearing	9- Oil Plug

3.1.6- Version of Gearbox : PV / PN / PT
Gear Size : 27 / 29 / 35 / 39
Output Type : 01 / 1K / 1L

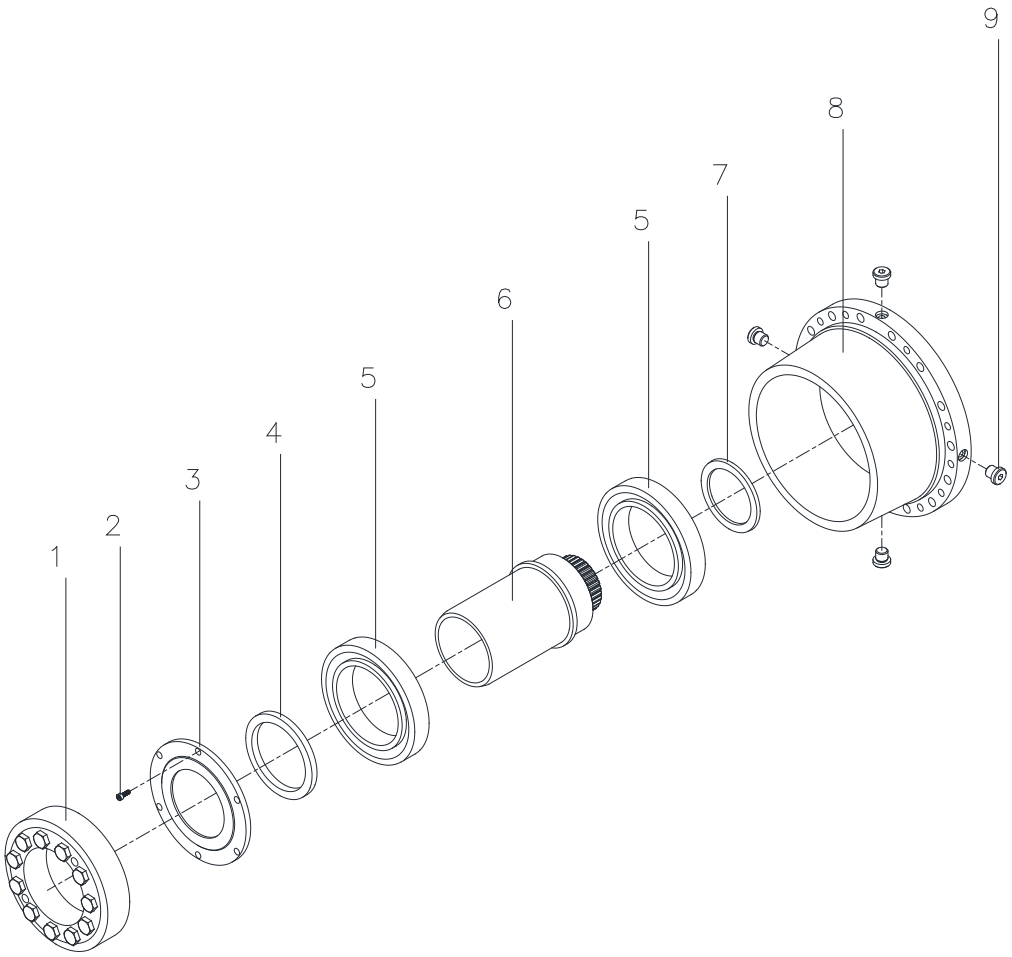


Parts may differ for special applications.

Standard Part List

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

3.1.7- Version of Gearbox : PV / PN / PT
Gear Size : 27
Output Type : 0S

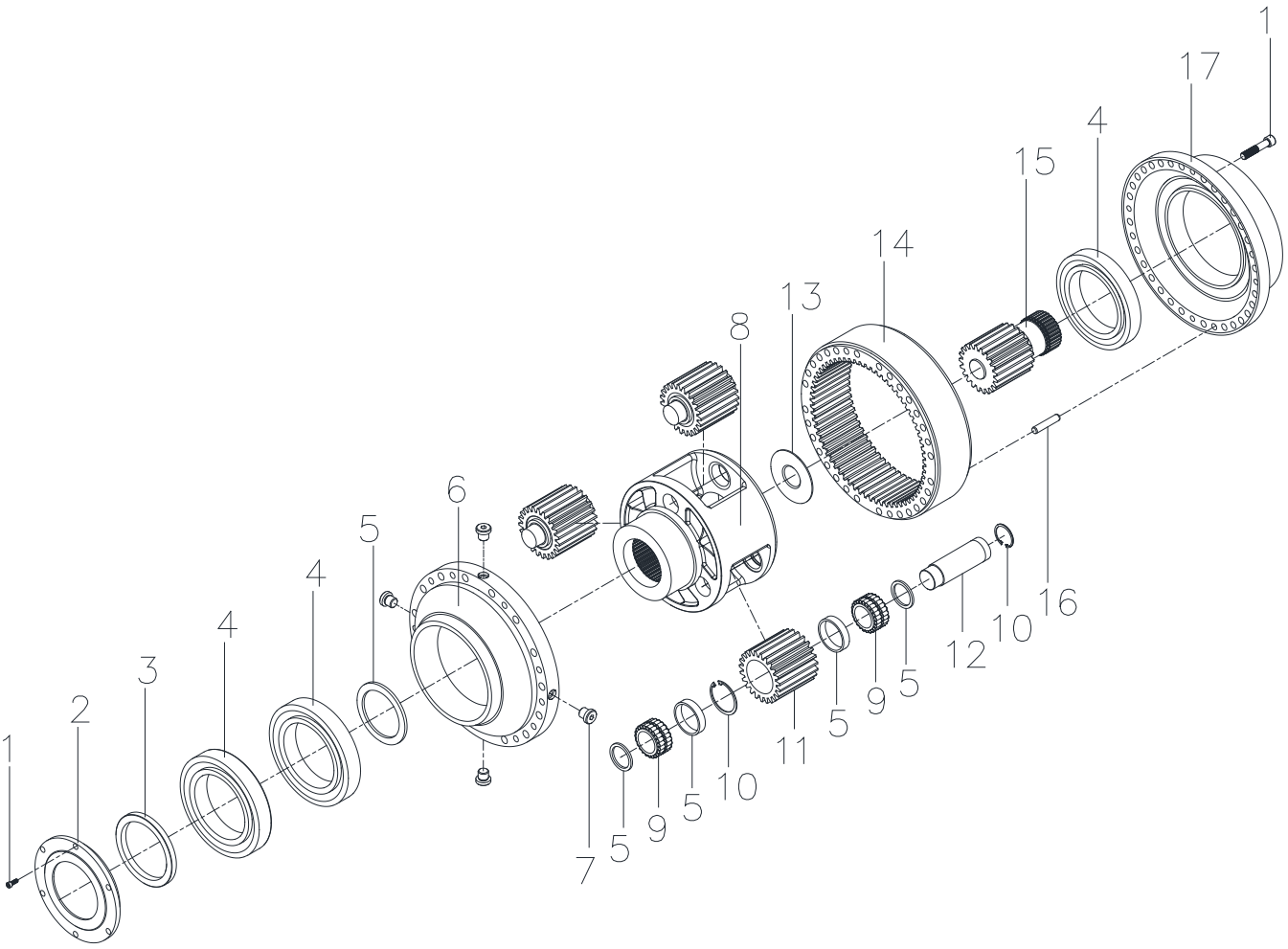


Parts may differ for special applications.

Standard Part List

1- Shrink Disc	6- Hollow Shaft
2- Bolt	7- Spacer
3- Seal Cover	8- Output shaft
4- Seal	9- Oil Plug
5- Bearing	

3.1.8- Version of Gearbox : PV / PN / PT
Gear Size : 27 / 29 / 35 / 39 / 41
Output Type : 0K / 0L

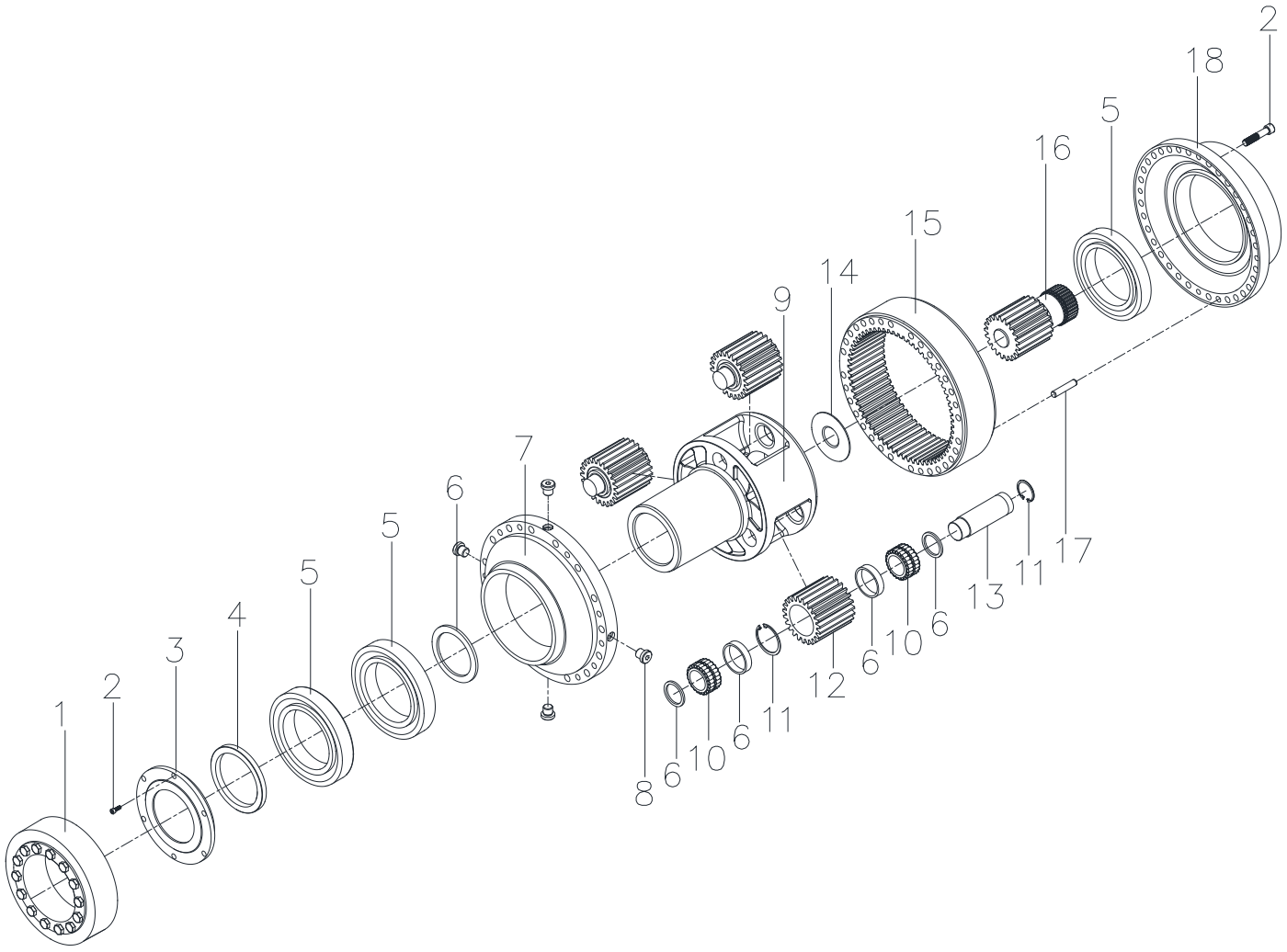


Parts may differ for special applications.

Standard Part List

1- Bolt	6- Output Flange	11- Planetary Gear	16- Pin
2- Seal Cover	7- Oil Plug	12- Pin	17- Flange
3- Seal	8- Splined Hollow Shaft with Carrier	13- Washer	
4- Bearing	9- Neddle Roller and Cage	14- Internal Gear	
5- Spacer	10- Circlip	15- Sun Gear	

3.1.9- Version of Gearbox : PV / PN / PT
Gear Size :29 / 35 / 39 / 41
Output Type :0S

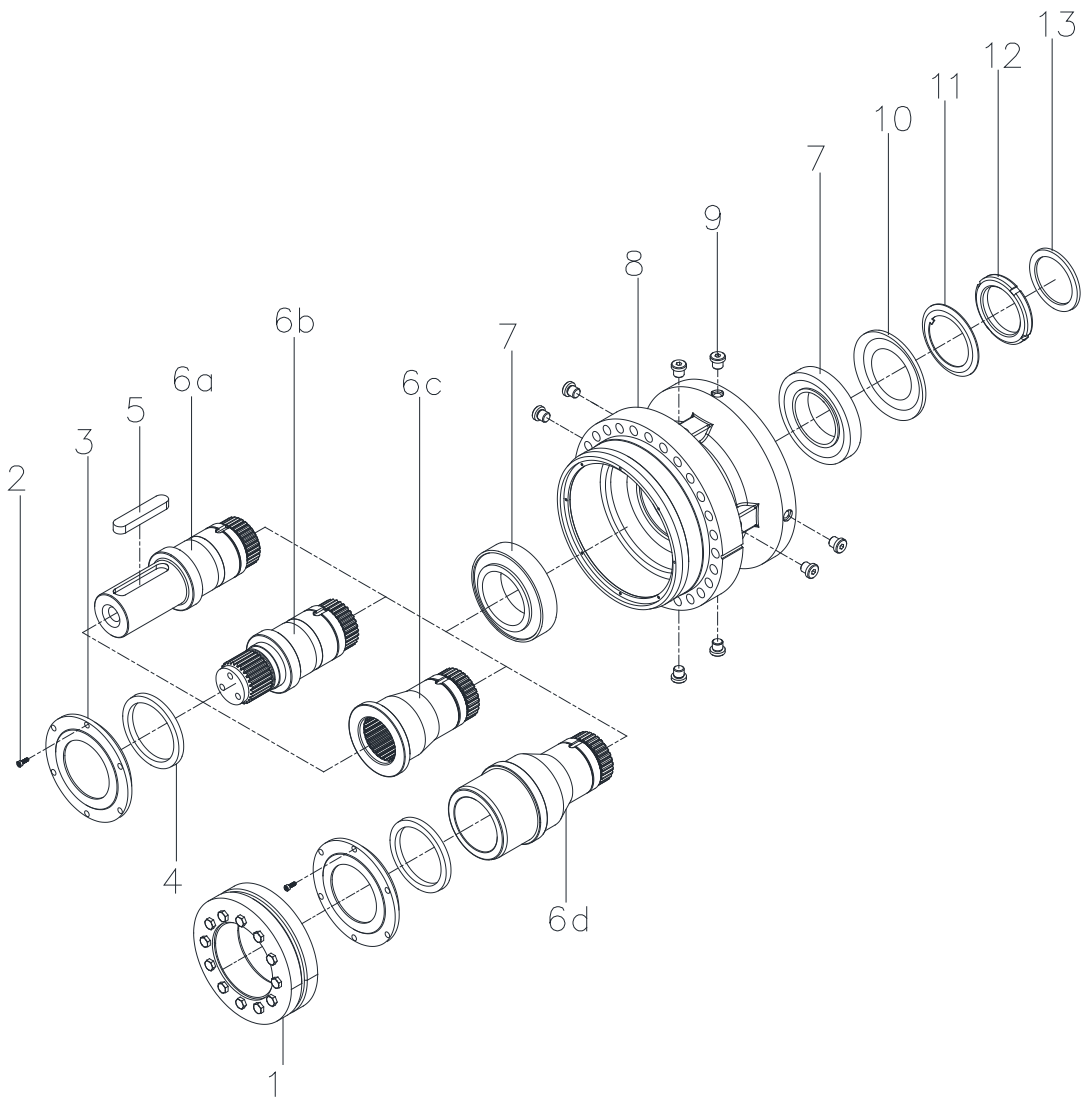


Parts may differ for special applications.

Standard Part List

1- Shrink Disc	6- Spacer	11- Circlip	16- Sun Gear
2- Bolt	7- Output Flange	12- Planetary Gear	17- Pin
3- Seal Cover	8- Oil Plug	13- Pin	18- Flange
4- Seal	9- Hollow Shaft with Carrier	14- Washer	
5- Bearing	10- Neddle Roller and Cage	15- Internal Gear	

3.1.10- Version of Gearbox : PV / PN / PT
Gear Size : 37
Output Type : 01 / 1K / 1L / 0K / 0L / 0S

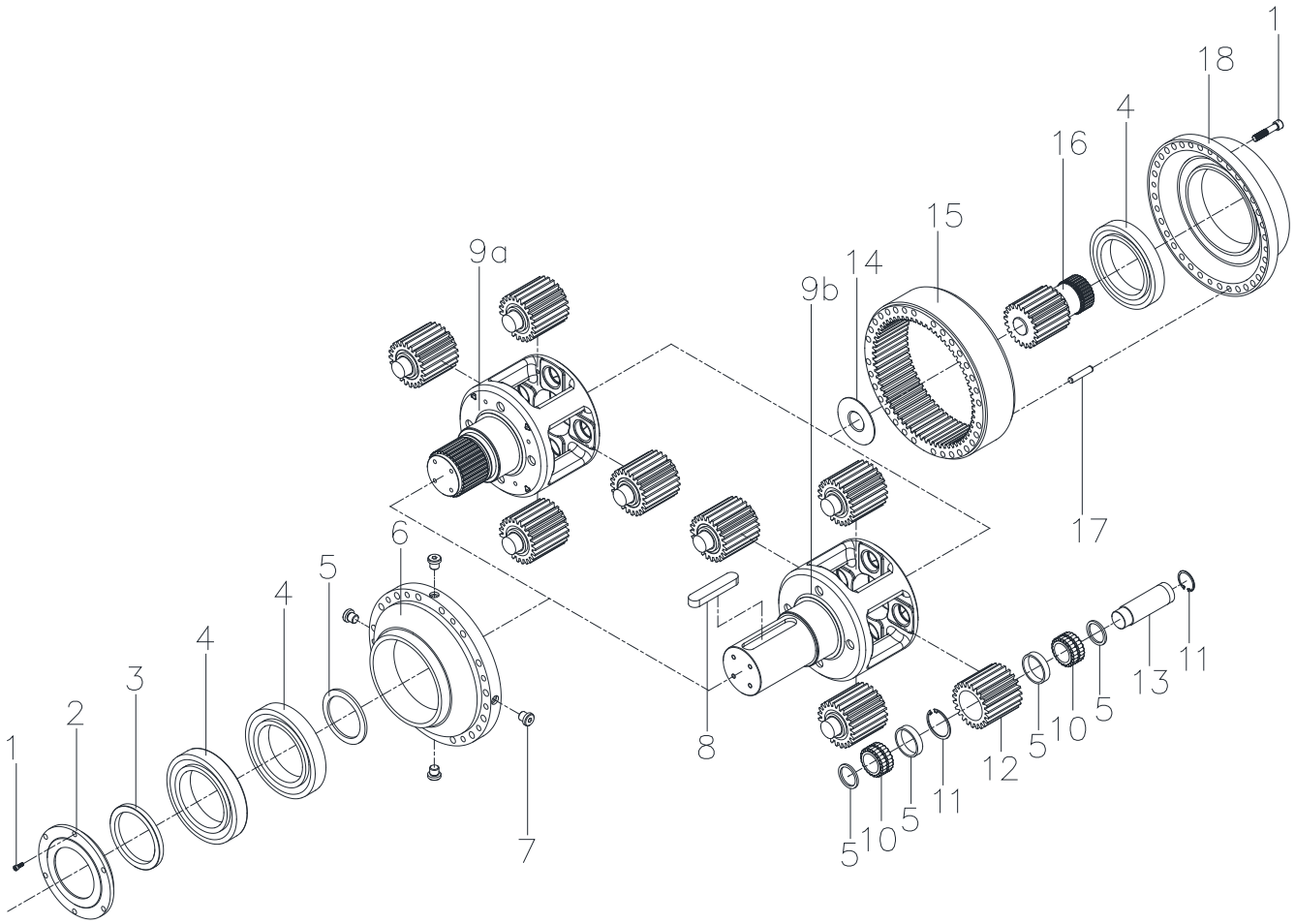


Parts may differ for special applications.

Standard Part List

1- Shrink Disc	6a- Output Shaft	8- Output Flange	13- Spacer
2- Bolt	6b- Splined Solid Output Shaft	9- Oil Plug	
3- Seal Cover	6c- Splined Hollow Shaft	10- Nilos Ring	
4- Seal	6d- Hollow Shaft	11- Tab Washer	
5- Key	7- Bearing	12- Locknuts	

3.1.11- Version of Gearbox : PV / PN / PT
Gear Size : 41
Output Type : 01 / 1K / 1L



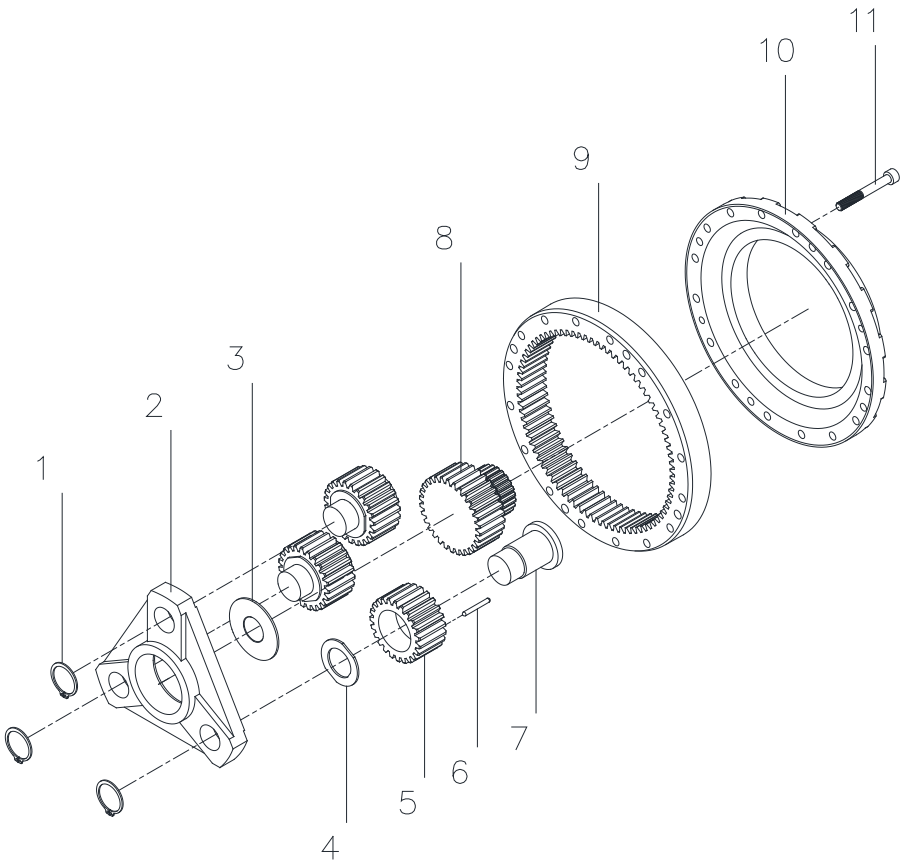
Parts may differ for special applications.

Standard Part List

1- Bolt	6- Output Flange	10- Neddle Roller and Cage	15- Internal Gear
2- Seal Cover	7- Oil Plug	11- Circlip	16- Sun Gear
3- Seal	8- Key	12- Planetary Gear	17- Pin
4- Bearing	9a- Splined Solid Output Shaft with Carrier	13- Pin	18- Flange
5- Spacer	9b- Output Shaft with Carrier	14- Washer	

3.2- Gear Group

3.2.1- Version of Gearbox : PV / PN / PT / RV / RN / RT
Gear Size :11/ 15
Output Type : ALL

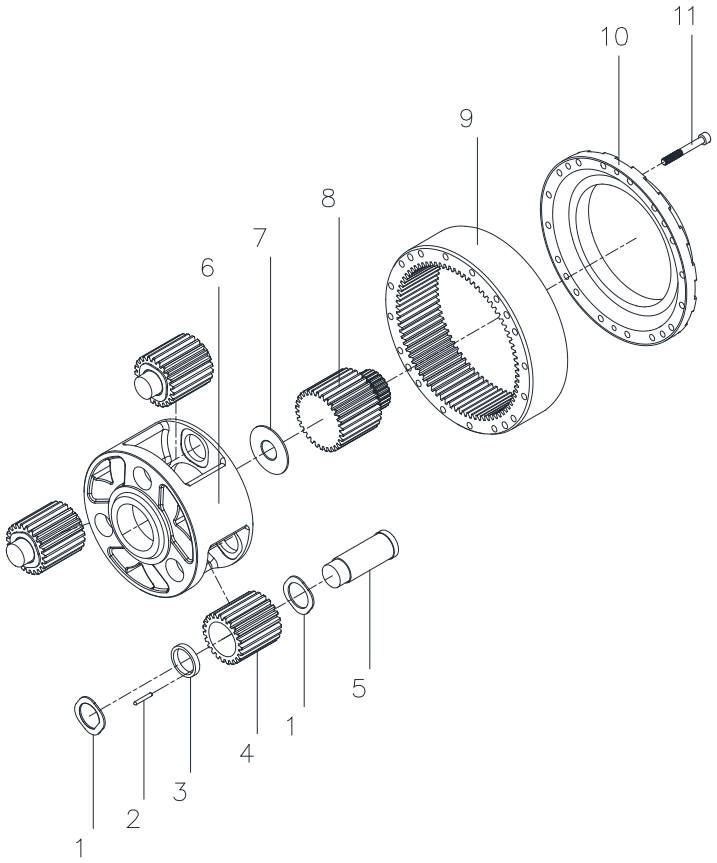


Parts may differ for special applications.

Standard Part List

1- Circlip	6- Neddle Roller	11- Bolt
2- Carrier	7- Pin	
3- Washer	8- Sun Gear	
4- Spacer	9- Internal Gear	
5- Planetary Gear	10- Flange	

3.2.2- **Version of Gearbox :** PV / PN / PT / RV / RN / RT
Gear Size :12 / 16 / 19 / 23 / 24 / 27 / 29 / 35 / 37 / 39 / 41
Output Type :ALL

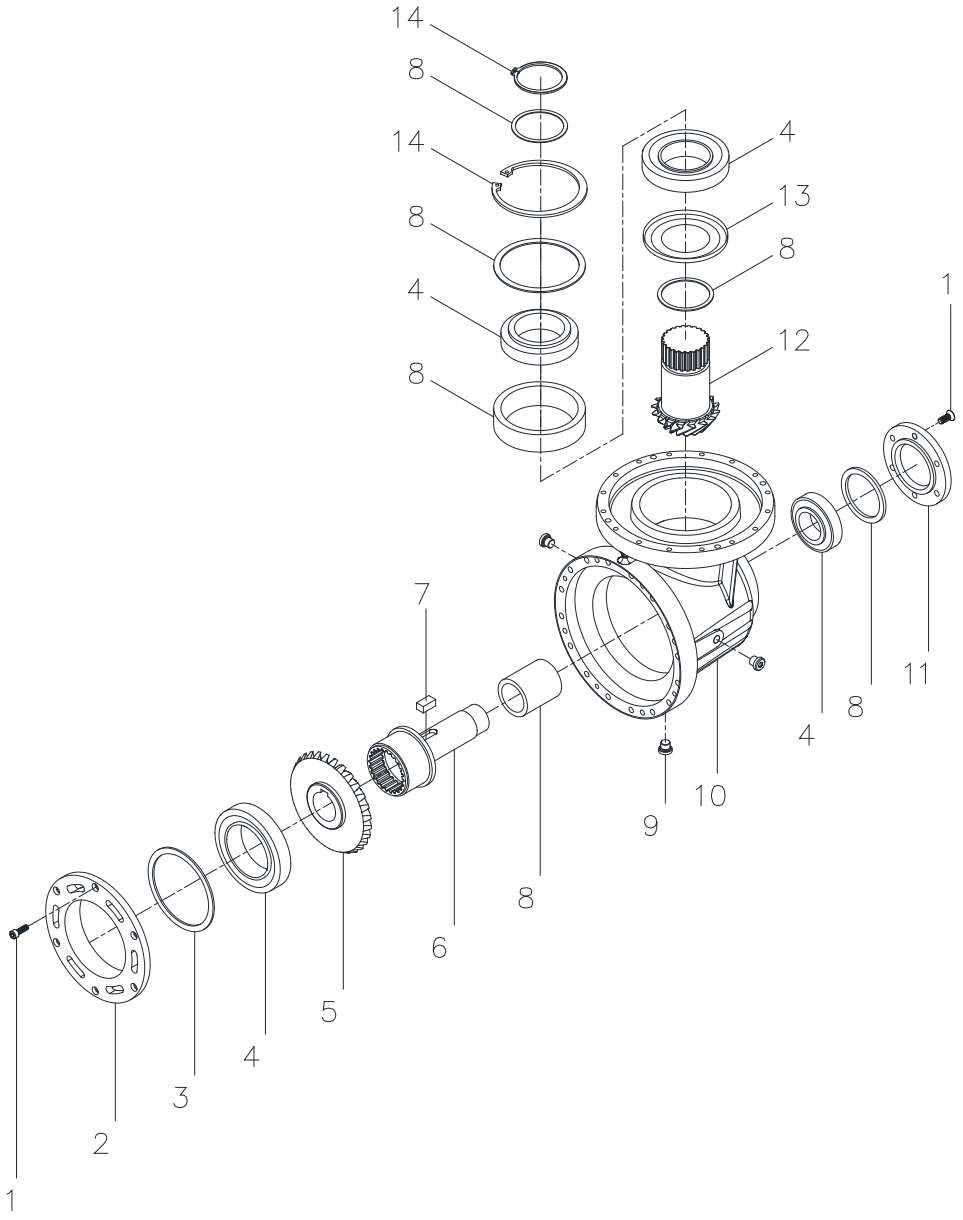


Parts may differ for special applications.

Standard Part List

1- Washer	6- Carrier	11- Bolt
2- Neddle Roller	7- Washer	
3- Spacer	8- Sun Gear	
4- Planetary Gear	9- Internal Gear	
5- Pin	10- Flange	

3.2.3-Version of Gearbox : PV / PN / PT / RV / RN / RT
Gear Size :11/ 12 / 15 / 16 / 19 / 23 / 24 / 29 / 35 / 37 / 39 / 41
Output Type :ALL



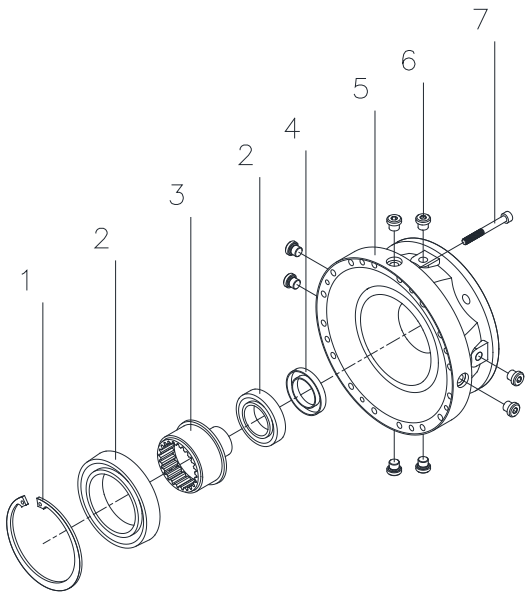
Parts may differ for special applications.

Standard Part List

1- Bolt	6- Sahft	11- Cover
2- Seal Cover	7- Key	12- Bevel Gear Shaft
3- Seal	8- Spacer	13- Nilos Ring
4- Bearing	9- Oil Plug	14- Circlip
5- Bevel Gear	10- Flange	

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 / 37 / 39 / 41
Input Type : IEC B5 Flange Type

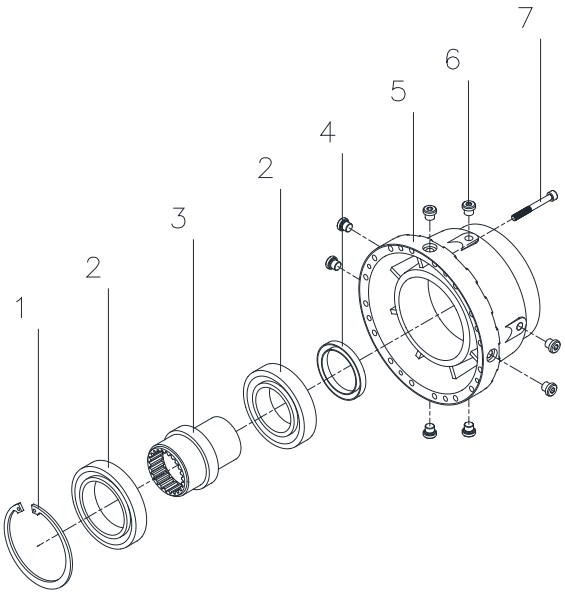


Parts may differ for special applications.

Standard Part List

1- Circlip	6- Oil Plug
2- Bearing	7- Bolt
3- Input Shaft	
4- Seal	
5- Input Flange	

3.3.2- Version of Gearbox : PV / PN / RV / RN
Gear Size : 11/ 12 / 15 / 16 / 19 / 23 / 24 / 29 / 35 / 37 / 39 / 41
Input Type : C26 / M46 input type for Hydraulic motor

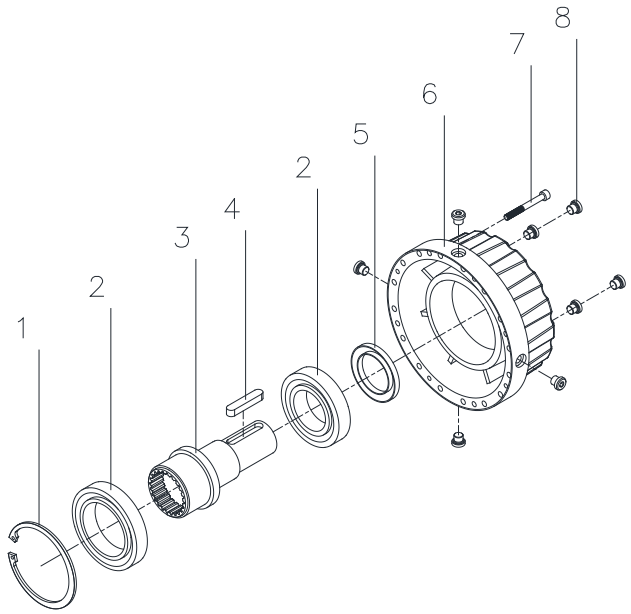


Parts may differ for special applications.

Standard Part List

1- Circlip	6- Oil Plug
2- Bearing	7- Bolt
3- Input Shaft	
4- Seal	
5- Input Flange	

3.3.3- Version of Gearbox : PV / PN / RV / RN
Gear Size :11 / 12 / 15 / 16 / 19 / 23 / 24 / 29 / 35 / 37 / 39 / 41
Input Type :Solid input shaft



Parts may differ for special applications.

Standard Part List

1- Circlip	6- Input Flange
2- Bearing	7- Bolt
3- Input Shaft	8- Oil Plug
4- Key	
5- Seal	



4- Safety

4.1- Intended Use

The gear reducer is designed for use in industrial machines. Please refer to our catalogue or our web page for the maximum permitted torques and speeds. The most important maximum permitted values are indicated on the nameplate of the product. But the all data can be found on our product catalogues. Using the product out of the product catalogue/ nameplate's permitted ranges will cancel the warranty/manufacturer declaration and YILMAZ REDÜKTÖR will not take any responsibility.

The gear units are intended for industrial machines and may only be used in accordance with the information provided in this manual the product catalogue and the nameplate of the gearbox. They comply with the applicable standards and regulations and meet the requirements of the directive 2006/42/EC. The gearbox must be started up, maintained and operated according this manual. The gearbox most be incorporated with 2006/42/EC confirming parts/machines.



If the motor is compatible with the data provided on the gearbox's nameplate, it is allowed to be installed and operated. If the motor is to be used with a frequency inverter, the frequency range at which the motor will operate must be notified to YILMAZ REDÜKTÖR at the time of order. If not notified, the product is allowed to operated at the input speed indicated on the nameplate. The electric motor and frequency inverter must be in accordance with 2006/42/EC



If the gear unit's input is used with variable speed mechanical drive systems (variator), this must be notified to YILMAZ REDUKTOR at the time of order. Otherwise, the product is allowed to operated at the input speed indicated on the nameplate.



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/catalogue entries. Different speed, higher motor power, higher radial/axial loads etc. than nameplate/catalogue is not allowed.



The ambient temperature must be between +5 , +40 celsius and no abrasive media must attack the paint and seals. If different working conditions this must be informed to YILMAZ REDÜKTÖR before ordering.



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

4.2- Improper Use

Every usage which exceeds the limits stated above, the nameplate and catalogue of the product (especially highest torques and speeds) is not compliant with the regulations, and thus prohibited.
The operation of the gear reducer is prohibited if;
-It was not mounted/installed according to regulations and this manual
-The gear reducer is very soiled
-It is operated without lubricant
-It is operated out of the permitted values provided on catalogues and/or nameplate



4.3- Safety Instructions

4.3.1- General Safety Instructions

4.3.1.1- Working On The Gear Reducer



- Inappropriately executed work can lead to injury or damage.
Make sure that the gear reducer is only installed, maintained and dismantled by trained technicians.



- Foreign bodies spinning through the air can cause grave injury.
Before putting the gear reducer into operation, check that there are no foreign bodies or tools near the gear reducer

4.3.1.2- Operation



- Touching hot surfaces can lead to burns.
Do not touch the gear reducer if their operation temperatures are too high, or use suitable safety equipment like gloves.



-Rotating machinery can lead to injuries. There is danger of being trapped or pulled in!
Keep a sufficient distance and make safeguarding to rotating machinery. See relevant norms EN349+A1, EN13857.

4.3.1.3- Maintenance



-An unintentional start of the machine during maintenance work can lead to serious accidents.
Make sure no one can start the machine while you are working on it.



- Even a brief running of the machine during maintenance work can lead to accidents if the safety devices are not operating.
Make sure that all safety devices are mounted and active.

4.3.1.4- Lubricant



- 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.

4.3.1.5- Ambient Conditions



- Standard gearboxes are allowed to work in ambient temperatures between +5 to +40 celsius unless differently specified on the nameplate. *Using the gear unit out of this range can cause damage to the gear unit or environment. Over +40 celsius ambient conditions the gear unit surface temp could be so high causing burns when touched.*



-If the gear unit will be used in outdoor applications the gear unit must be prevented from rain snow and dust. *Entering substances inside the gear unit from seals can damage the gear unit. Observe the safety instructions for outdoor use EN12100:2010.*

4.4- Tightening Torques

All screwed connections for which a tightening torque is specified, must on principle be tightened with a calibrated torque wrench and checked. Use the following torques for the threaded bores over the gear unit housing. For connecting elements refer to the mechanical installation part.

Bolt Size	Tightening Torques [Nm] (Coefficient of Friction in the Thread-μG=0,12)		
	Grade: 8.8	Grade: 10.9	Grade: 12.9
M5	6	9	10
M6	10	15	17
M8	25	36	42
M10	48	71	83
M12	84	123	144
M14	133	195	229
M16	206	302	354
M20	415	592	592
M24	714	1017	1190
M30	1428	2033	2380
M36	2482	3535	4136

The values in the table above are from VDI2230 Part1:2015 - Table A1

4.5- Case of Fire

The gear reducer itself is not combustible. However, it usually contains a synthetic or mineral gear oil.
Please observe the following if the gear reducer is situated in a burning environment

4.5.1- Suitable Extinguishing Agents, Protective Equipment

Always keep suitable extinguishing, protective equipment like carbon dioxide, powder, foam, fog easily accessible around the gear unit.

-High temperature produce irritating steam.
Use a protective breathing apparatus.

4.5.2- Unsuitable Extinguishing Agents

Do not spray with water!

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

If gear motors are used, please also refer to the manual of the motor manufacturer.

Before you install the gearbox you have to be sure that the gearbox is arrived with the all necessary equipment and without damage. Thinks to take into consideration before you start to install the unit;
- You have received the correct operation manual of the your product.
- The gearbox and all its parts are transported without damage.
- The gearbox is stored correctly according the instructions in this manual
- You have the latest product catalogue or you have access to our web page.

5.1- Transportation

When the goods arrive, first check for any damage. If some damage observed, immediately contact the transport company and inform about the damage. Contact YILMAZ REDUKTOR for the damage and do not start to install the unit until it is agreed that the damage has no effect of operation.

Please use the rope for lifting and carrying by wrapping around the gearbox or use the eyebolt indicated position as shown on next pages. If you can not find lifting adequate pictures for your product please contact YILMAZ REDUKTOR. The eyebolts should be capable to carry the weight of gearboxes. Do not hang additional loads on the gearbox by lifting. Use suitable hoisting equipment which is capable to hold the gear units weight. Refer to the catalogue for various types weights.

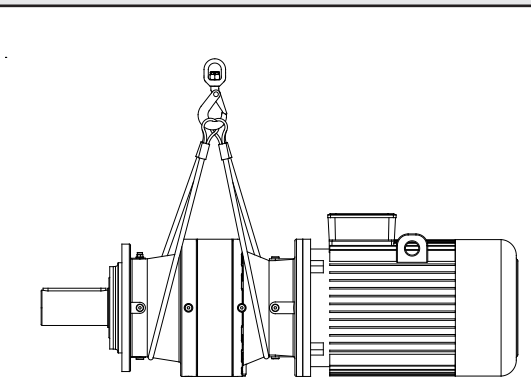
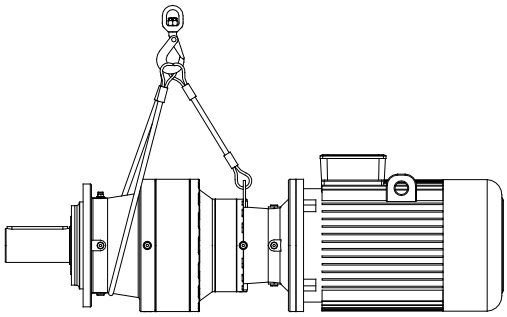
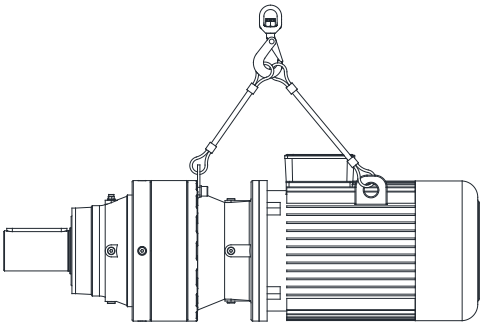
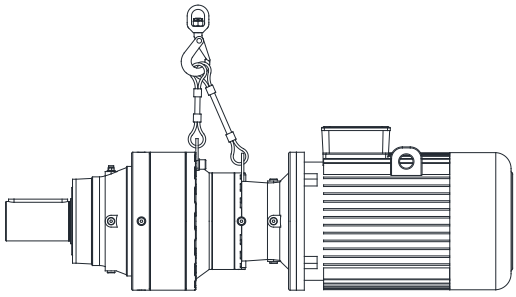
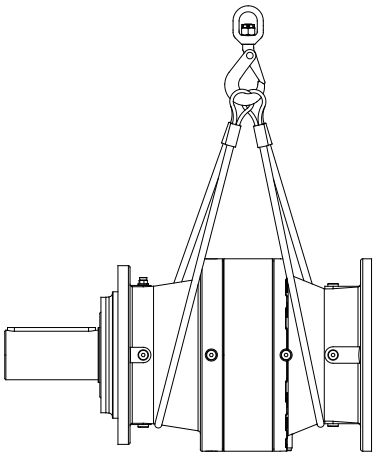
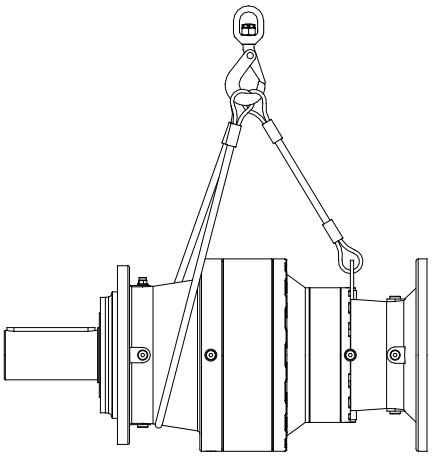
Do not stay beneath / under the lifting / hoisting equipment which may cause serious injuries by falling down objects, accidental movements, unexpected accidents.

STOP

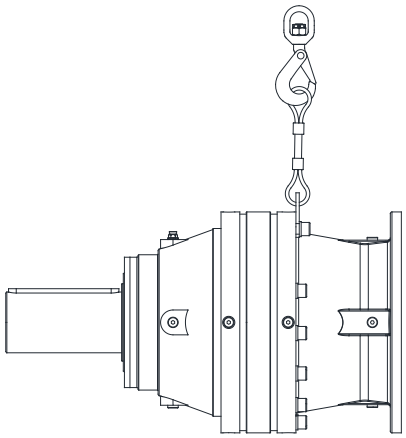
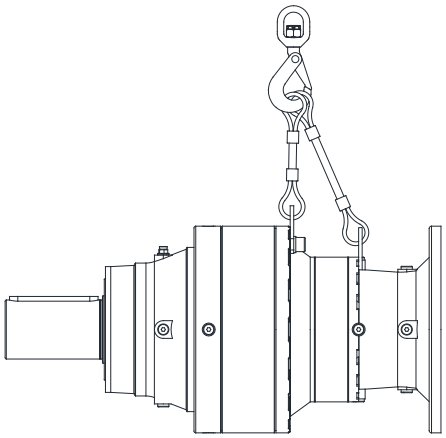
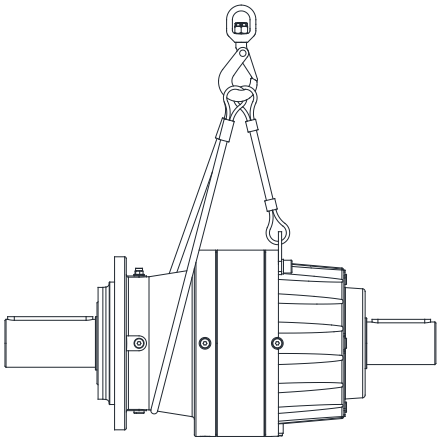
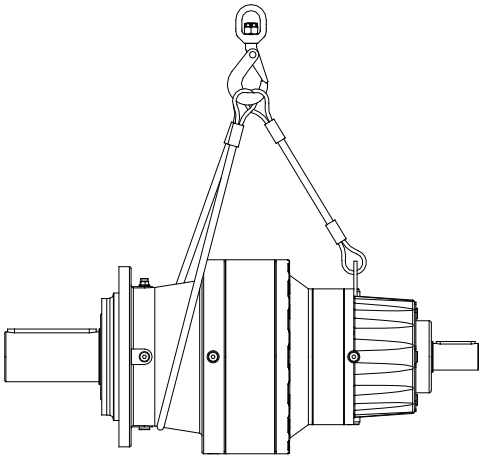
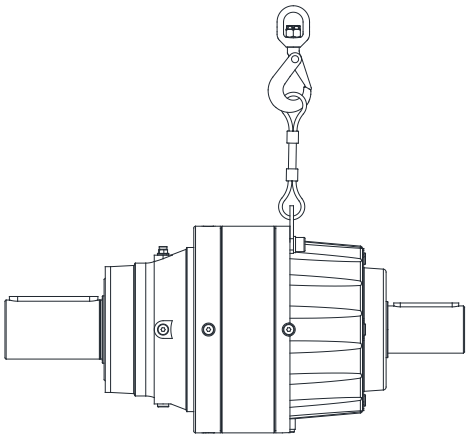
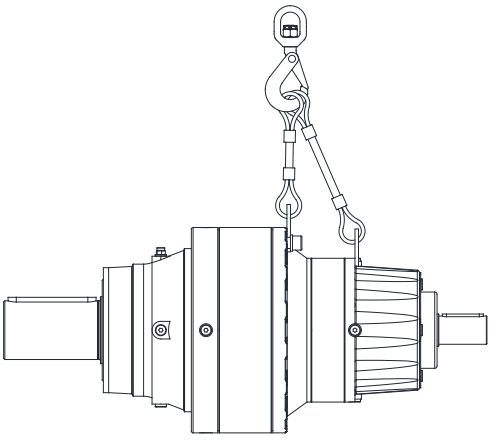
Falling or hard placement can damage the gear unit.
Only use hoisting and securing equipment which is permitted for the size / weight of your gear unit. Ensure that the load is slowly and carefully handled and placed.

Lifting and carrying types are indicated on following pages.

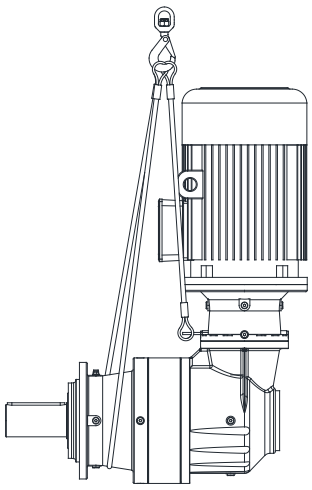
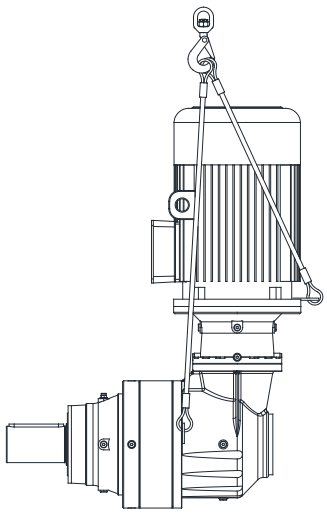
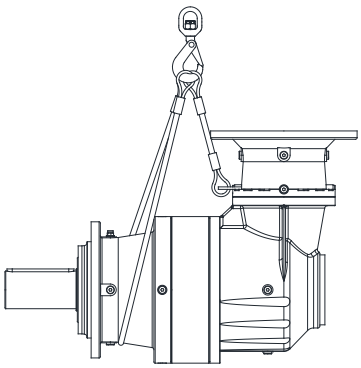
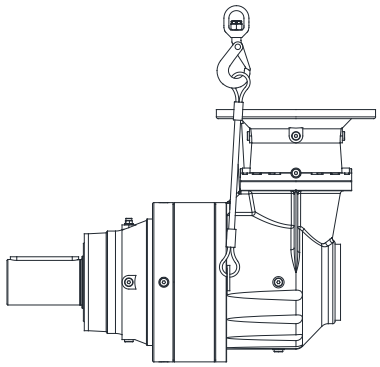
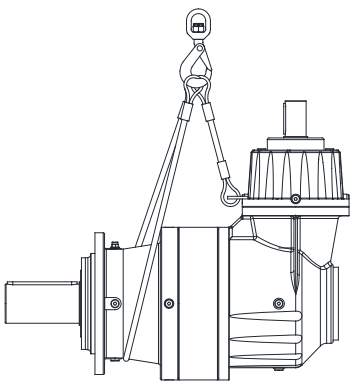
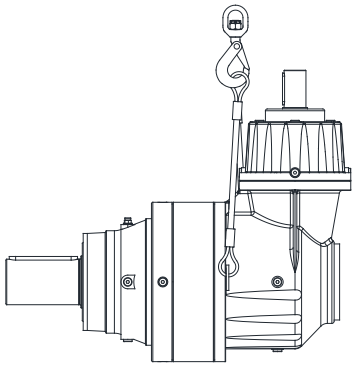
5.1.1- P...L.01 Types Lifting Positions

Type	Single Stage	MultiStage
PV..L.01 (From P11 To P24 and P37)		
PV..L.01 (P27,P29,P35,P39,P41)		
PN..L.01 (From P11 To P24 and P37)		

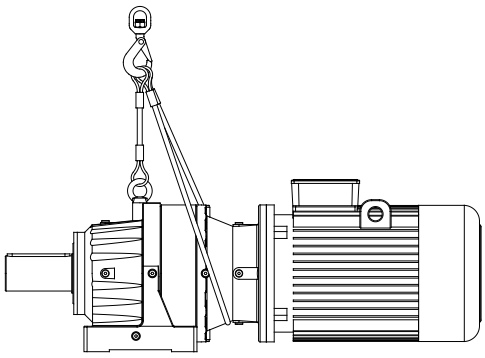
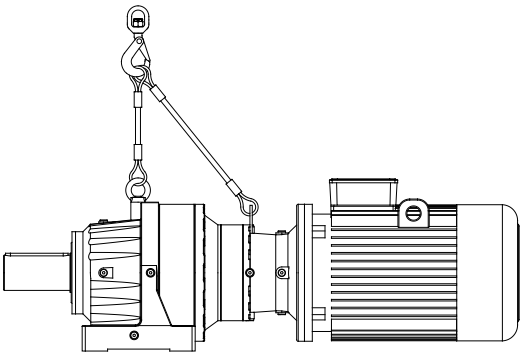
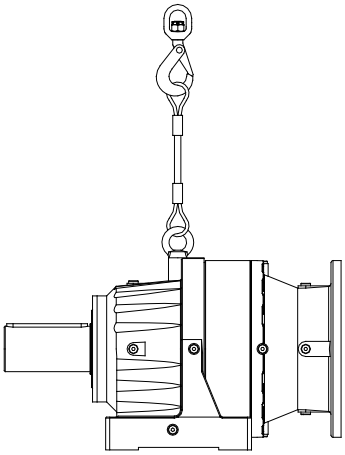
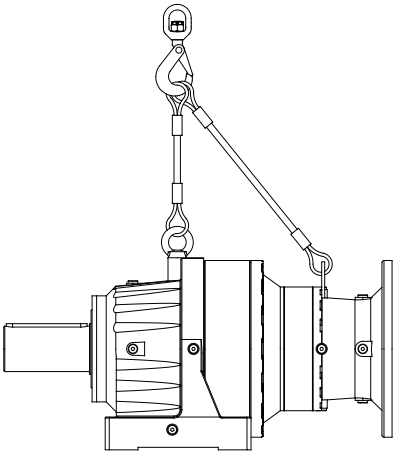
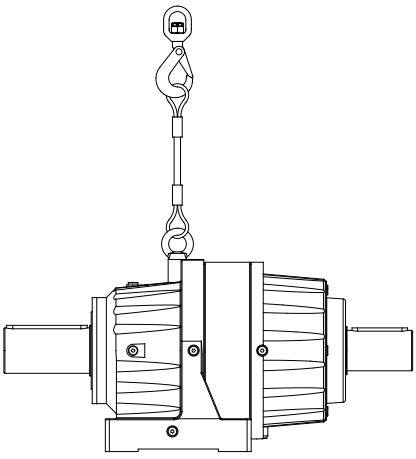
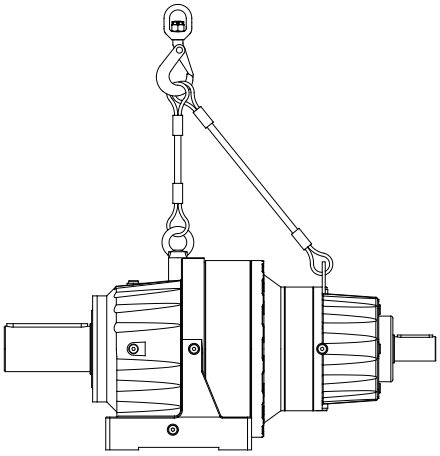
5.1.1- P...L.01 Types Lifting Positions

Type	Single Stage	MultiStage
PN..L.01 (P27,P29,P35,P39,P41)		
PT..L.01 (From P11 To P24 and P37)		
PT..L.01 (P27,P29,P35,P39,P41)		

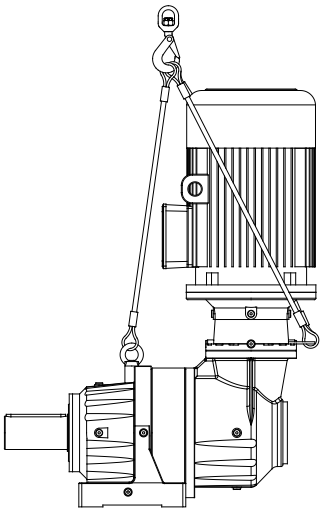
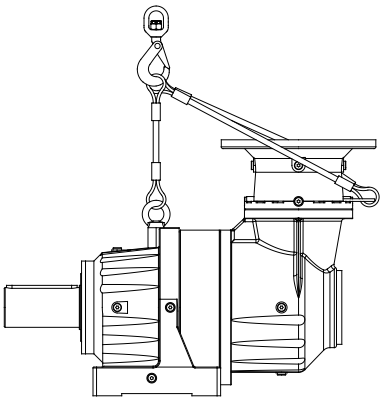
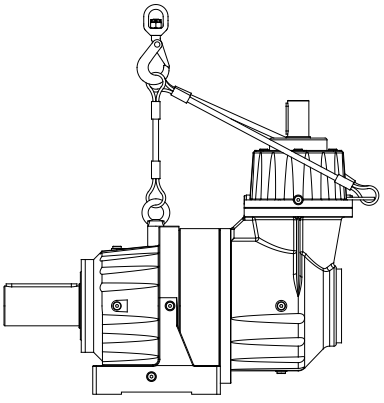
5.1.2- P...K.01 Types Lifting Positions

Type	MultiStage	Type	MultiStage
PV..K.01 (From P11 To P24 and P37)		**PV..K.01 (P27,P29,P35, P39,P41)**	
PN..K.01 (From P11 To P24 and P37)		**PN..K.01 (P27,P29,P35, P39,P41)**	
PT..K.01 (From P11 To P24 and P37)		**PT..K.01 (P27,P29,P35, P39,P41)**	

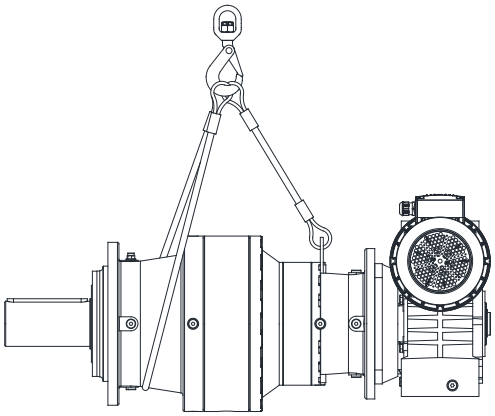
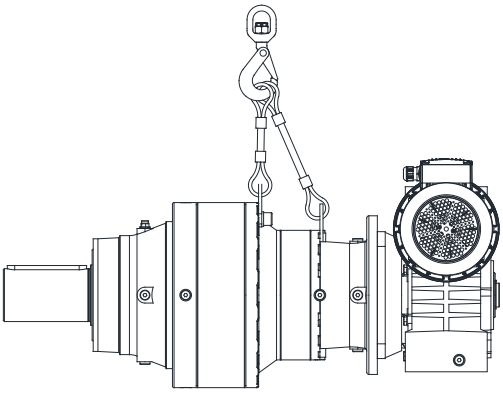
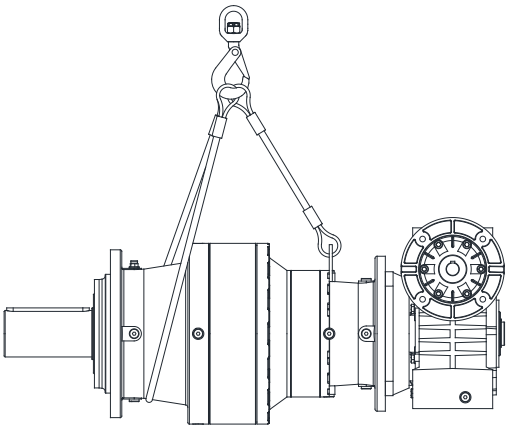
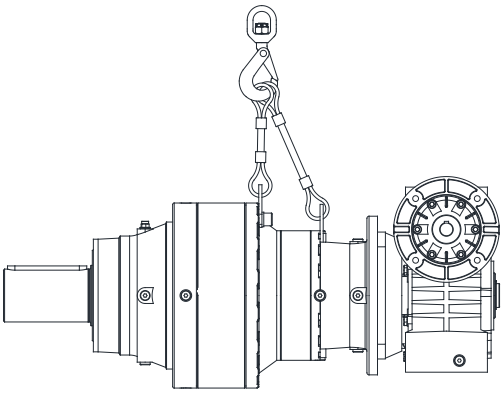
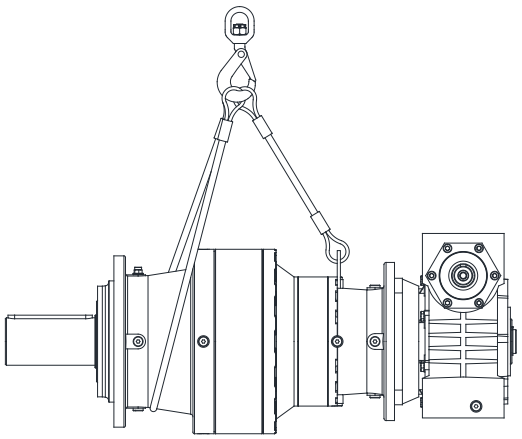
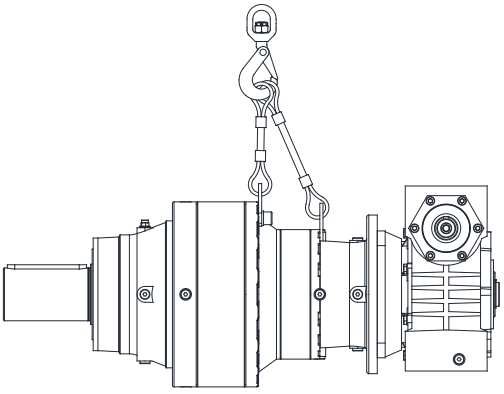
5.1.3- R...L.01 *Types Lifting Positions*

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

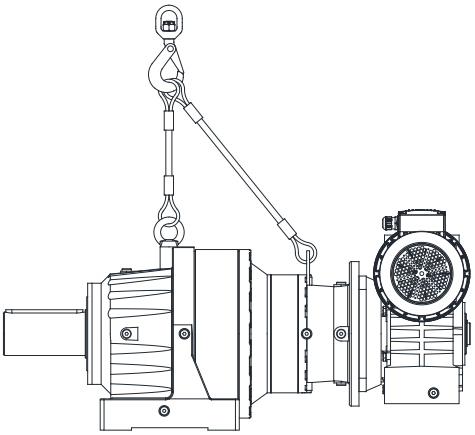
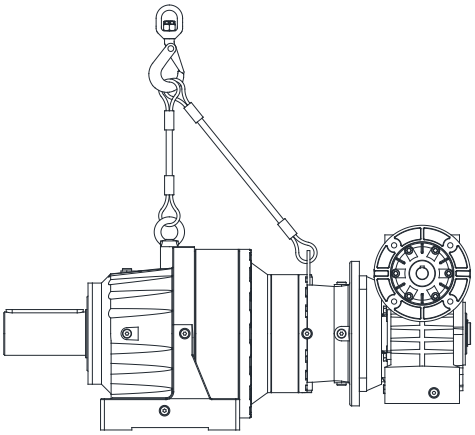
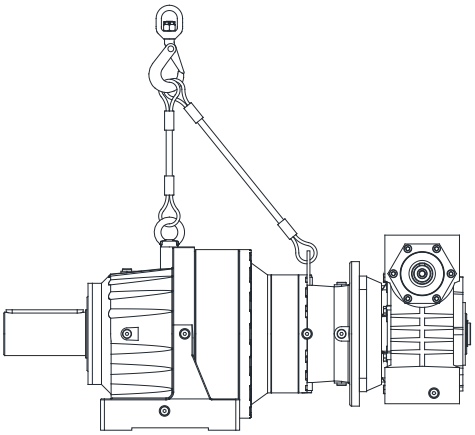
5.1.4- R...K.01 Types Lifting Positions

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

5.1.5- 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		

5.1.6- 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**

5.2- 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 year with regular check. The ambient temperature should be between -5 to 60 Celsius degrees

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 regular check during this time is recommended.

If stored in open protect against insect damage.

6- Installing The Gear Unit

6.1- Before You Start

- Observe the gear unit for damages of storage or transportation. If any damage please contact YILMAZ REDUKTOR.

- Be sure that you have all the equipment necessary for installing like; Spanners, torque wrench, shims and distance rings, fixing devices for input and output elements, lubricant, bolt adhesive etc.

- This manual is not for 2014/34/EU (ATEX) conforming gear units. For 2014/34/EU conforming gear units refer to the ATEX range manual. ATEX conforming gear units have name plates indicating the zone and the temperature class and are different from standard type geared units. Therefore Standard units can not be installed on Potentially explosive atmospheres.

6.2- Check the Shaft Dimensions to Fit

Type	Solid Output Shaft Diameter	Output Shaft Tolerance
P/R11..	50	0 / +0.02
P/R12..	50	0 / +0.02
P/R15..	60	+0.01 / +0.03
P/R16..	60	+0.01 / +0.03
P/R19..	80	+0.01 / +0.03
P/R23..	90	+0.01 / +0.04
P/R24..	90	+0.01 / +0.04
P/R27..	110	+0.01 / +0.04
P/R29..	120	+0.01 / +0.04
P/R35..	140	+0.02 / +0.04
P/R37..	160	+0.02 / +0.04
P/R39..	160	+0.02 / +0.04
P/R41..	180	+0.02 / +0.04

6.3- Check the Ambient Temperature

The ambient temperature must be between +5 celsius to +40 celsius for standart type gear units. If different contact YILMAZ REDUKTOR for special solutions.

6.4- Check the Voltage Supply

The standard geared motors are supplied with 230/400 V 50/60Hz. up to 3kW including 3kW and 400/690 V 50/60 Hz. over 3kW and is indicated on the motors name plate unless it is differently ordered. In case of only gear unit is supplied from YILMAZ REDÜKTÖR please observe the name plate of the electric motor and the instructions of the supplier. Check the basic electric connection diagrams below. Use experienced electric technician.

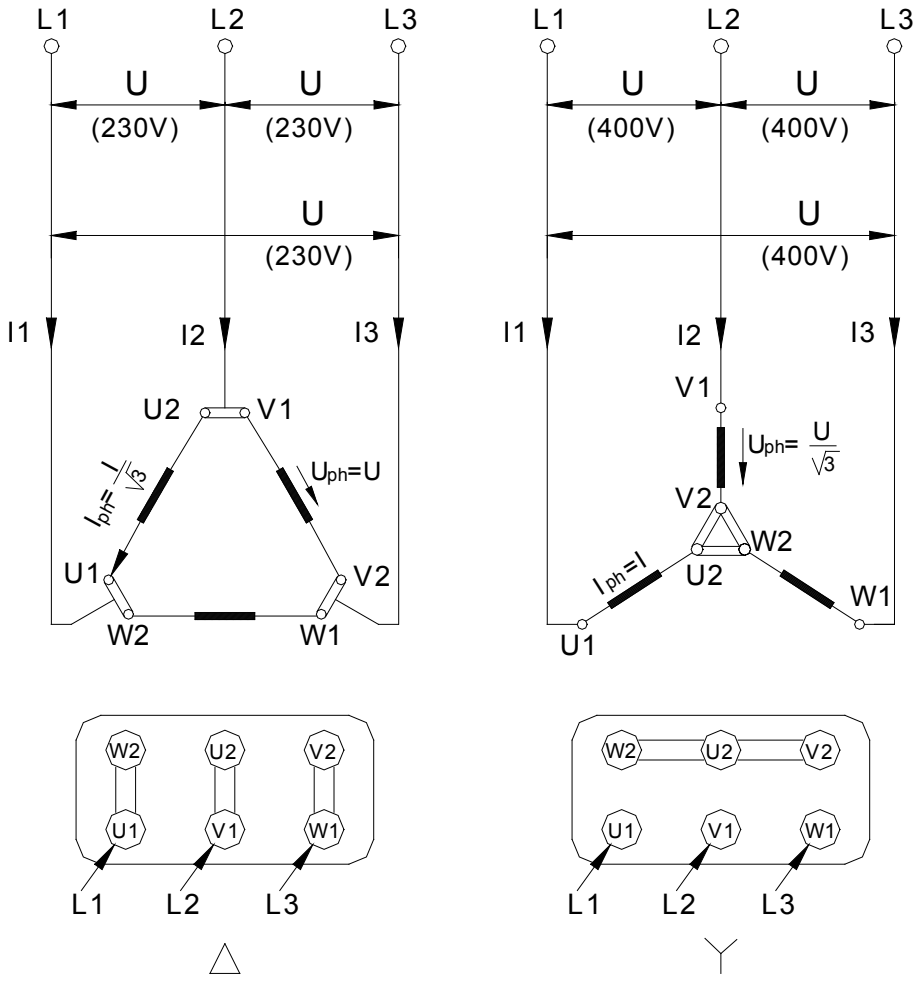
STOP *Using wrong connection or voltage can damage the electric motor or environment.*

The following wiring diagram is for standard 230/400 V 50Hz AC electric motors. For different voltages please contact YILMAZ REDUKTOR. For gear units supplied without motor, refer to the motor manufacturers user Manuel.

The electric connection must be done by experienced electric technician.
The gearbox, the motor and the brake must be grounded to prevent potential differences of earth and gearbox/motor.

Pole Number	Nominal Powers at 400V, 50Hz	
	230V (Δ) / 400 V (Y)	400V (Δ)
2 or 4	≦ 3 kW	⩾ 4 kW
6	≦ 2,2 kW	⩾ 3 kW
8	≦ 1,5 kW	⩾ 2,2 kW
Starting Principle	Direct	Direct or Y/Δ

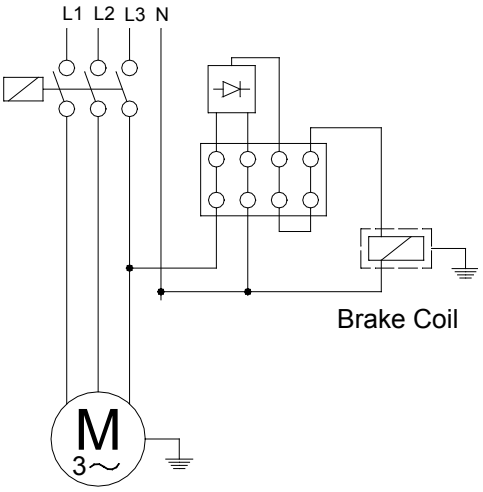
Basic motor connection wiring diagram



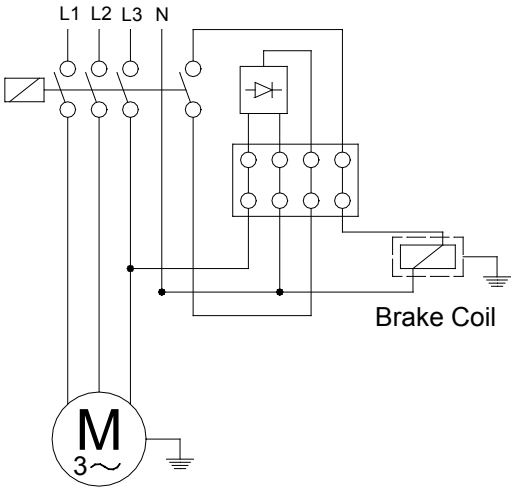
Standard Type Brakes Basic Wiring Diagram

The electric connection must be done by experienced electric technician.
The gearbox and the motor must be grounded to prevent potential differences of earth and gearbox/motor.

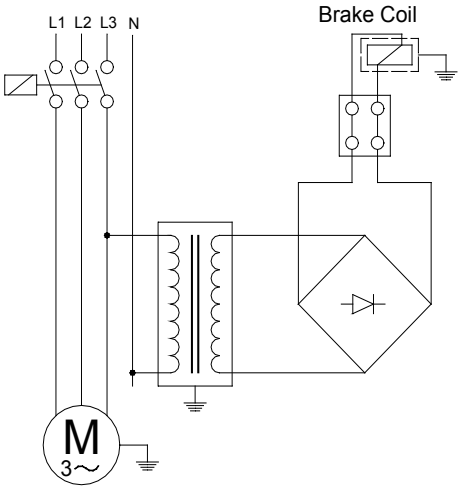
Delayed Running Brake (220V)



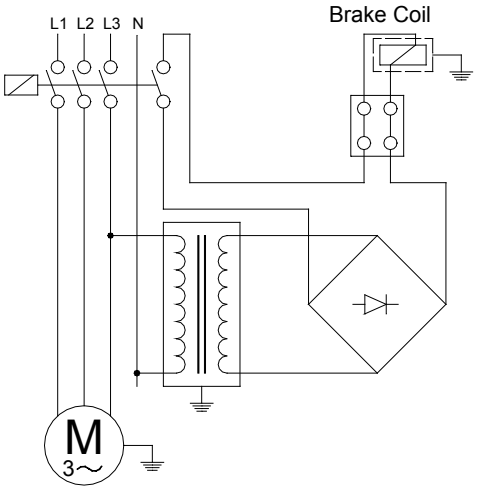
Sudden Brake (220 V)



Delayed Running Brake (24 V)



Sudden Brake (24 V)



6.5- 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. Refer to the mounting positions and oil quantities on this manual and adjust the oil level accordingly with the recommended oil types given on this manual.
If the gearbox is used in a different mounting position than that specified on the nameplate without obtaining approval, the CE conformity is automatically canceled; furthermore, the manufacturer's warranty obligation is also extinguished.

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

6.6- Use of Breather Plug

Breather plug is delivered with the gearbox together by YILMAZ REDUKTOR. Breather plug must be on the top of the gearbox according to mounting position.

As shown in the label below, the transport protection rubber must be removed before operating the gear unit.



Breather plugs open at 0.2 bar pressure.

6.7- 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 by screwing half way out the level plug and see if oil comes out from that plug. If oil comes out tighten the plug again. If no oil comes out take out the filling plug and add oil until oil comes out from the level plug and tighten both plugs after finish. Be sure you are using the correct oil mentioned on the oil tables on this manual.

After checking the oil level of the gearbox, tighten the screws carefully to prevent oil leakage.

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

6.8- 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.

6.9- 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 REDUKTÖR for solutions.

To reduce the temperature increase of the gearbox, dust should be removed from the housing of the gearbox.

STOP

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.

6.10- Check Accessibility to Filling, Breather and Drain Plugs

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

7- Mechanical Installation

The gear unit can only be installed using the supplied connection points like foot and flange assembling points.

To install the gear unit without the supplied connection points can cause serious injuries by loosening or braking the gear unit. Even the gear unit is installed totally correctly according this manuel, be sure that no one will be harmed by accidentally brake downs or loosening.

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.

STOP

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

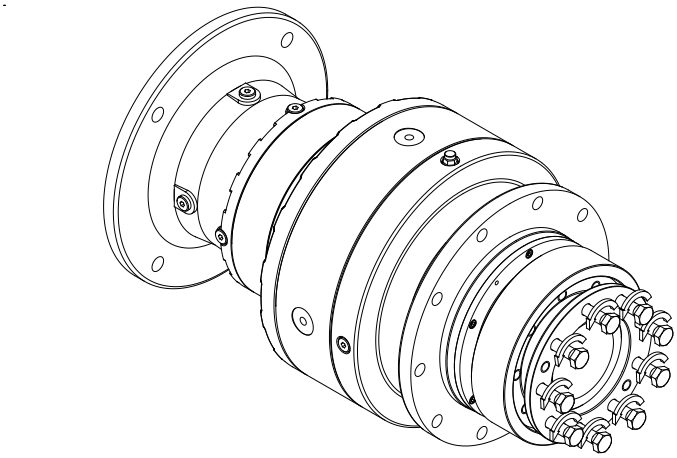
Secure the gear unit using 8.8 or higher quality bolts.

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

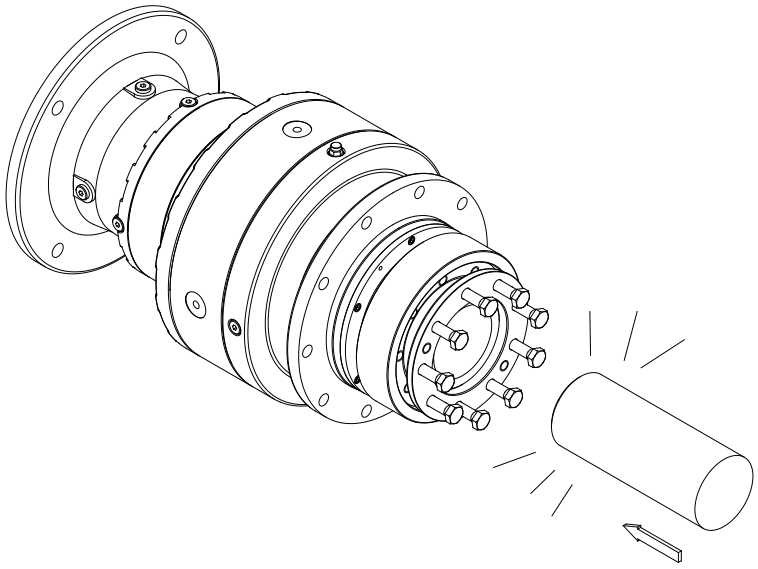
For different kind of basic installations refer to the following illustrations.

7.1- Assembling customer shaft with shrink disc

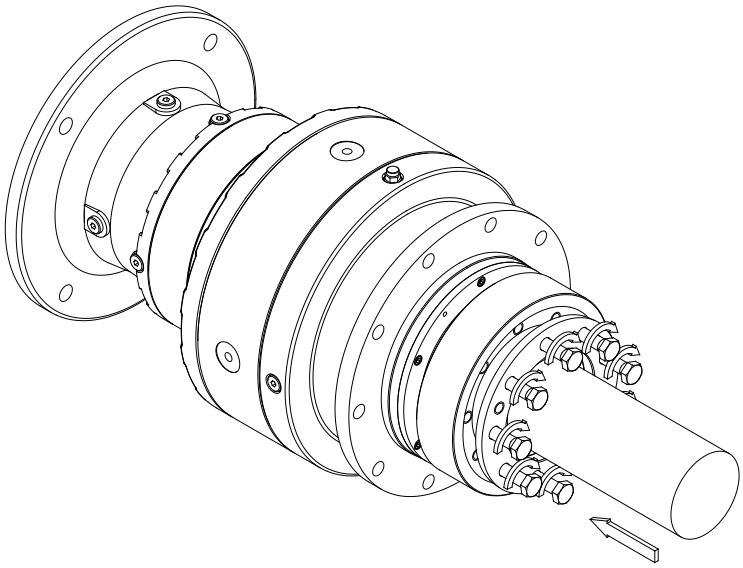
7.1.1- Loosen the bolts of the shrink disc



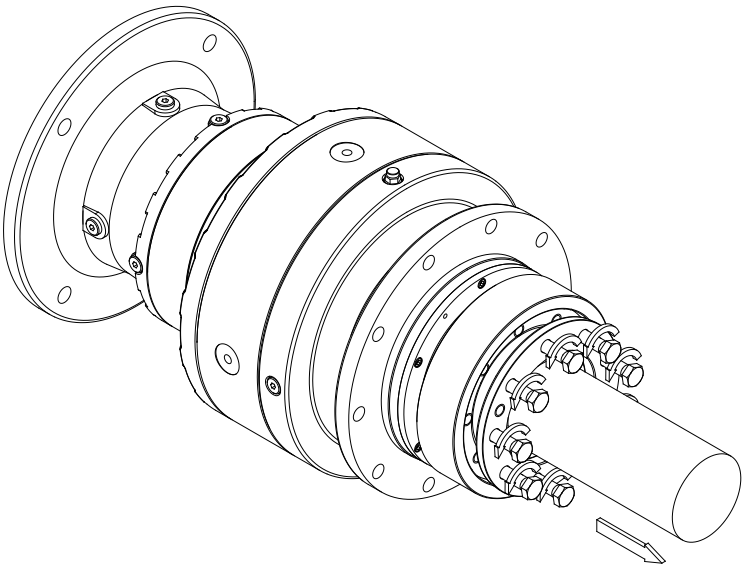
7.1.2- Use a solvent available in your market to clean all the dirt an oil from the shaft and shrink disc hollow. The surfaces must be free from oil or any dirt. The solvent must be removed from the surfaces as well.



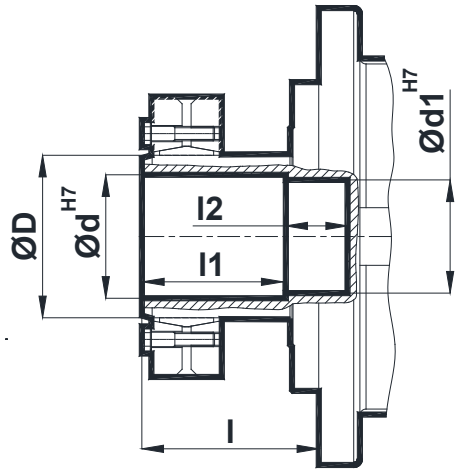
7.1.3- Insert the shaft and tighten the bolts as shown. Be sure that there is a clearance between the shrink disc shoulder and the hollow shaft shoulder of the gearbox.



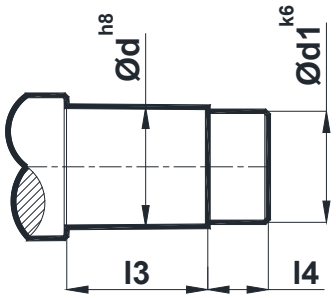
7.2- Disassembling customer shaft with shrink disc
7.2.1- Loosen the bolts of the shrink disc and take out the shaft.



7.3- Dimensions of the hollow shaft with shrink disc and the customer shaft



Customer Shaft



Size	ØD	Ød	Ød1	l	l1	l2	l3	l4	M x z (12.9)	Ta [Nm]
P11..0S	50	42	35	50	42	15	37	15	M6x8	12
P12..0S	62	52	35	50	42	15	37	15	M6x10	12
P15/16..0S	90	75	65	85	70	26	65	26	M8x10	30
P19..0S	110	90	75	115	90	50	85	50	M10x9	59
P23/24..0S	130	100	85	120	100	35	95	35	M10x12	59
P27..0S	175	130	-	290	155	-	150	-	M16x10	250
P29..0S	175	135	-	190	150	-	145	-	M16x10	250
P35..0S	185	140	130	235	157	38	152	38	M16x14	250
P37..0S	240	180	160	260	210	40	205	40	M20x12	490
P39..0S	240	180	160	260	210	40	205	40	M20x12	490
P41..0S	240	180	165	265	221	44	216	44	M20x12	490

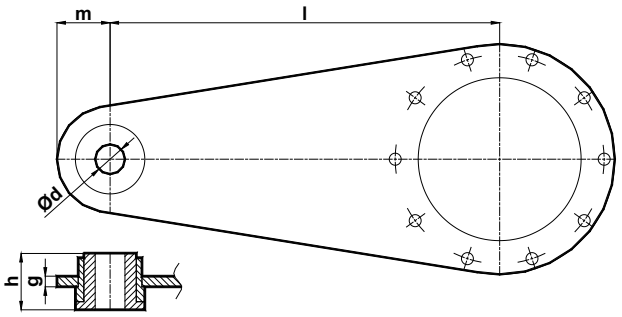
Desired surface roughness value: Rz ≤ 16 µm

Ta: Tightening torque

7.4- Assembling Gear Unit with Torque Arm
7.4.1- Dimensions

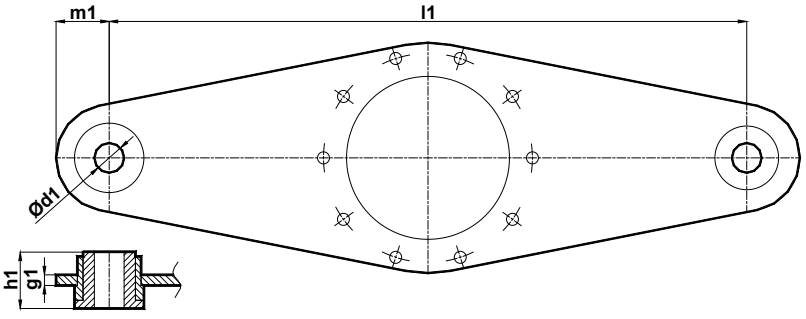
Torque arm dimension shown on below according to size of planetary gearbox.

One Sided Torque Arm



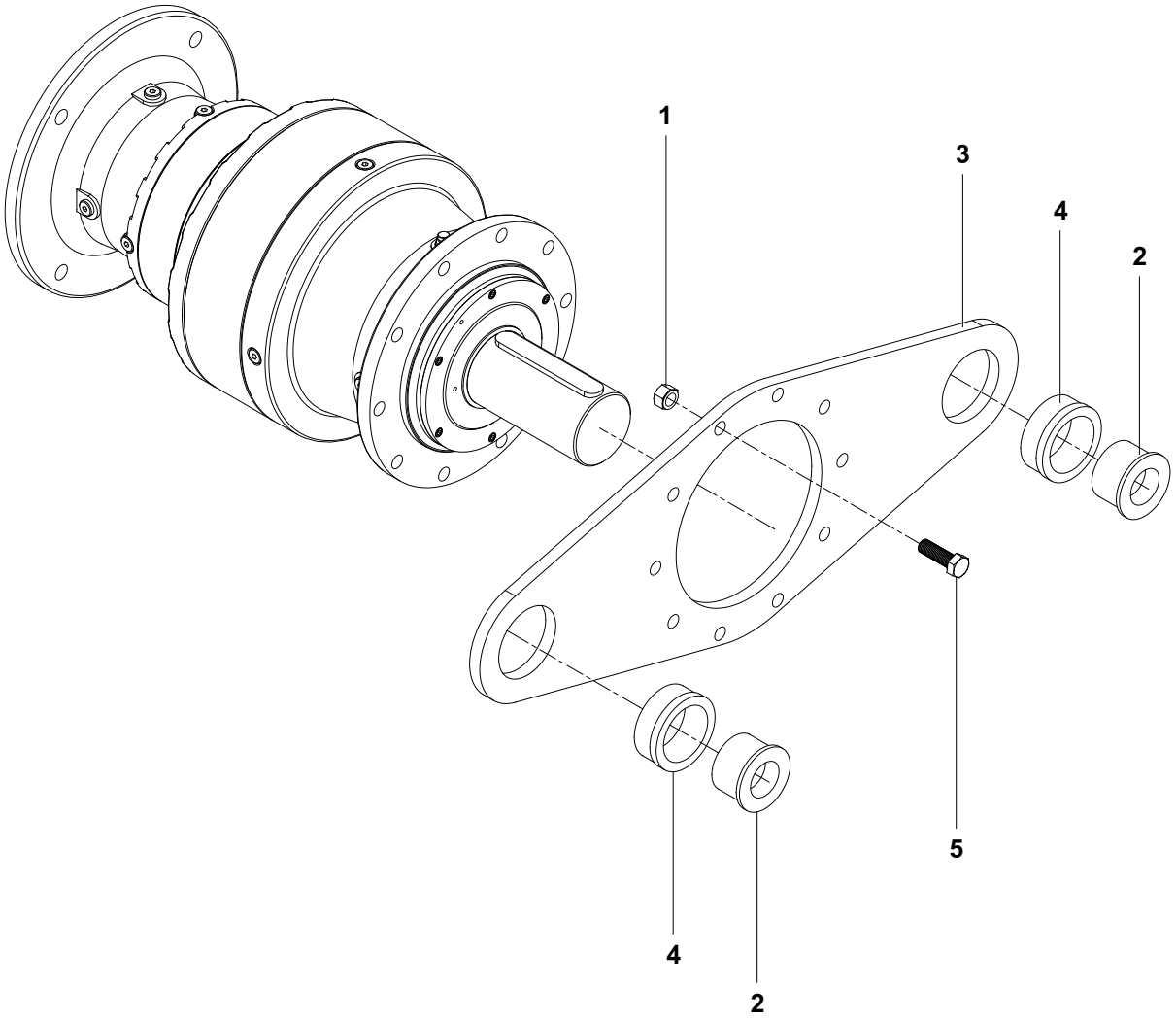
Type	l	m	d	h	g
P11/P12	300	60	21	60	12
P15/P16	350	60	32	60	15
P19	400	60	32	70	20
P23/P24	450	75	42	80	25
P27	700	90	52	100	25
P29	800	90	52	100	25
P35	900	120	72	120	30
P37/P39	1100	150	92	155	40
P41	1280	150	92	155	40

Two Sided Torque Arm



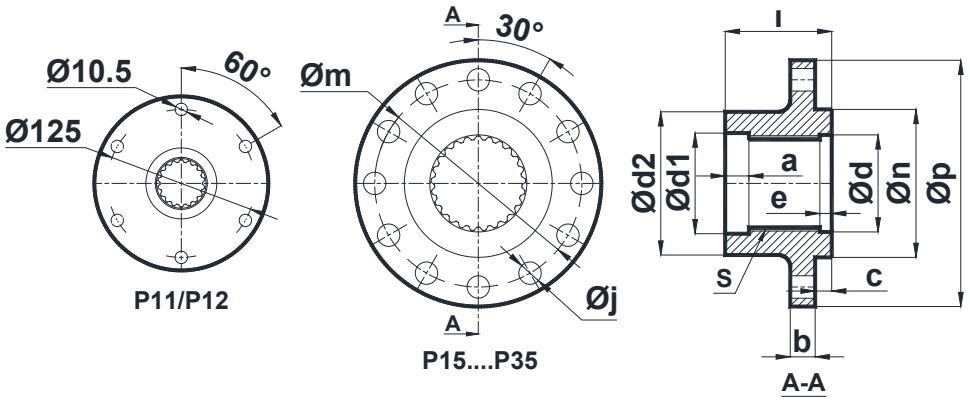
Type	l1	m1	d1	h1	g1
P11/P12	450	60	21	60	12
P15/P16	500	60	32	60	15
P19	600	60	32	70	20
P23/P24	700	75	42	80	25
P27	1000	90	52	100	25
P29	1100	90	52	100	25
P35	1200	120	72	120	30
P37/P39	1400	150	92	155	40
P41	1500	150	92	155	40

7.4.2- Assemble the parts as shown bellow



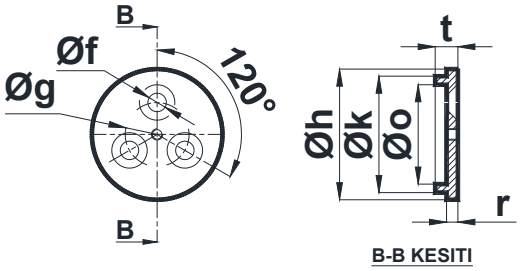
1- Nut	4- Spacer
2- Rubber Buffer	5- Bolt
3- Torque Arm	

7.5- Drum Connection Flange



	a	b	c	Ød	Ød1	Ød2	e	Øj	l	Øm	Øn	Øp	S (DIN 5480)
P11 / P12	15	10	8	42	42	60	5	10,5	55	125	60	147	N40x2x30x18x9H
P15 / P16	15	14	10	62	62	95	8	12,5	68	145	95	165	N60x2x30x28x9H
P19	20	21	14	72	72	121	10	19	90	175	125	208	N70x3x30x22x9H
P23 / P24 / P27	32	24	20	105	105	145	12	21	110	212	170	254	N100x4x30x24x9H
P29	32	30	20	122	122	181	12	25	110	260	200	309	N120x4x30x28x9H
P35	32	31	19	122	122	181	10	25	130	260	200	309	N120x4x30x28x9H

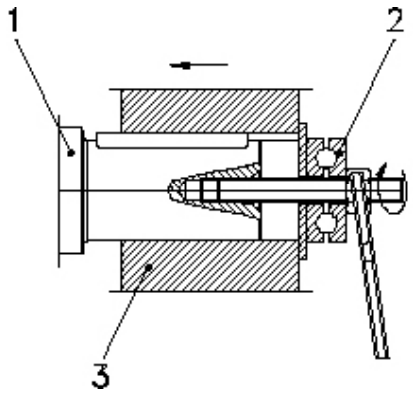
7.5.1- Drum Connection Flange



	Øf	Øg	Øh	Øk	Øo	Ør	t
P11 / P12	6,5	24	52	42	35	4	8
P15 / P16	10,5	32	70	62	50	7	13
P19	11	45	80	72	60	7	15
P23 / P24 / P27	15	65	114	105	85	10	20
P29 / P35	17	70	134	122	100	11	20

7.6- Fitting output shaft elements

Use the following illustration to assemble output shaft units



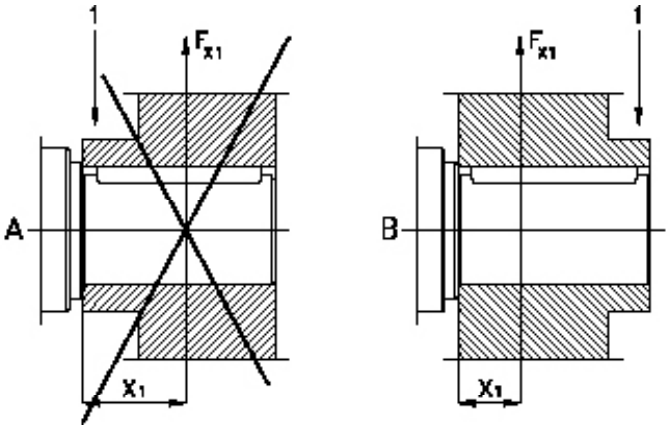
1) Gear shaft end
2) Thrust bearing
3) Coupling hub

STOP 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

STOP Power transmision elements must be balanced after fitting and must not give rise to any impermissible radial or axial forces.

7.7- Correct position of output shaft elements

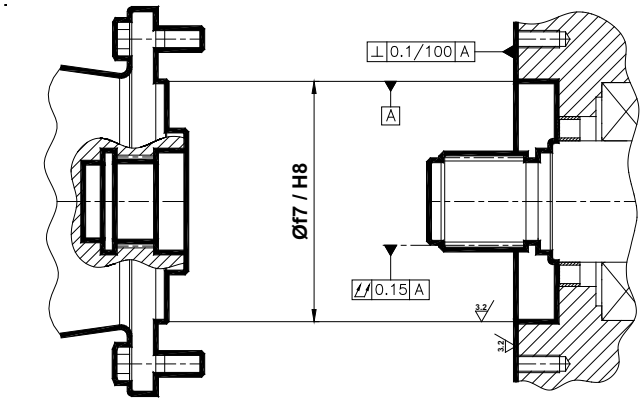
The Output Shaft unit (transmission elements) must placed as close as possible to the gear unit so that the radial load is as closest as possible to the gear unit.



1) Hub

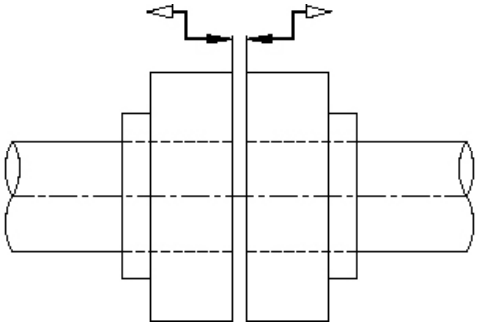
7.8- Correct position of splined shaft output mounting positions

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

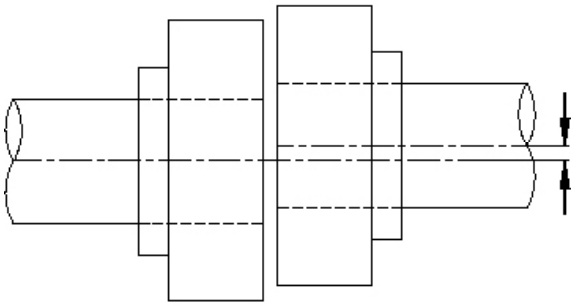


7.9- Fitting Couplings

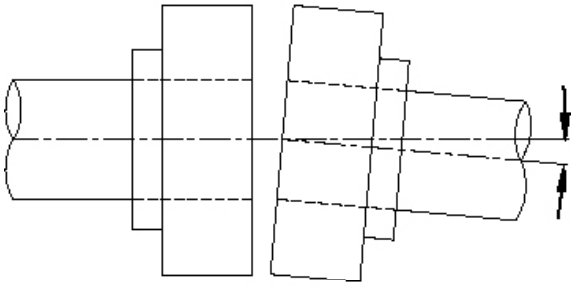
7.9.1- By fitting couplings be sure that there is some clearance between the two elements



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



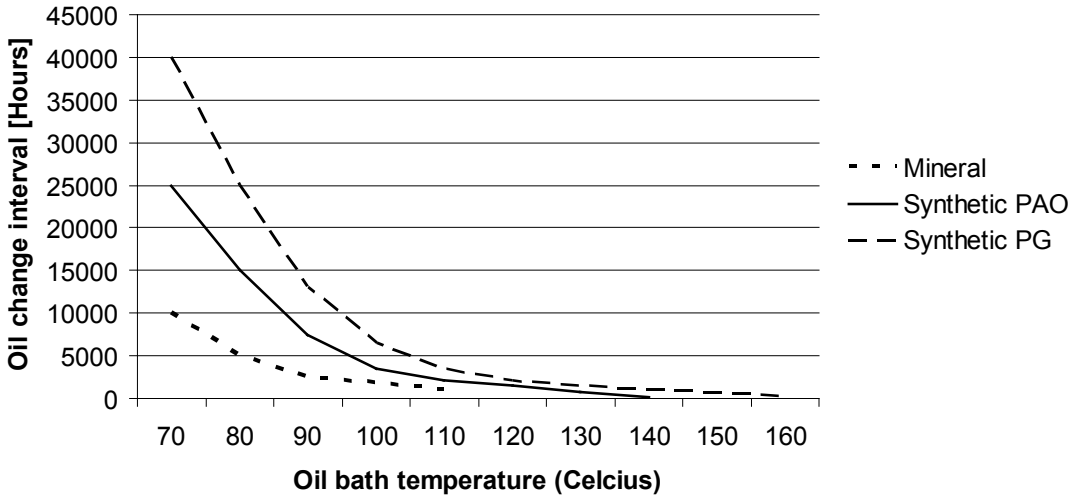
7.9.3- By fitting couplings be sure that the two shafts are not angular miss-aligned.



8- 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 3.000 working hours or every 6 months	Every 4.000 working hours	Every 10.000 working hours or every 3 years	Every 25.000 working hours
Check for oil leakage	x			
Check for oil level	x			
Check oil leakage from seal	x			
Check Rubber buffer	x (Change if necessary)			
Check Bearings 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 temperature should be taken as reference

Tables for oil types and quantities are given on the following pages. Quantities and oil type may differ from the values given here. For the type and amount of oil used in your gearbox, please refer to the label on the gearbox.

9- Lubrication

9-1 Oil Types

Yağ Cinsi *Lubricant* Art des Schmier-stoffes	**DIN 51517-3**	**Çevre Sıcaklığı [°C]** *Ambient Temp. [°C]* Umgebungstemp. [°C] **Daldırma Yağlama** *Dip Lubrication* Tauchschmierung	**ISO VG**	**Aral**	**Beyond Petroleum**	**Castrol**	**Klüber Lubrication**	**Mobil**	**Shell**	**Total**
Mineral Yağlar *Mineral Oil* Mineralöl	**CLP**	0 ... +50	680	Degol BG 680	Energol GR-XP 680	Alpha SP 680	Klüberoil GEM 1-680 N	Mobilgear XMP 680	Omala S2 GX 680	Carter EP 680
		-5 ... +45	460	Degol BG 460	Energol GR-XP 460	Alpha SP 460	Klüberoil GEM 1-460 N	Mobilgear XMP 460	Omala S2 GX 460	Carter EP 460
		-10 ... +40	320	Degol BG 320	Energol GR-XP 320	Alpha SP 320	Klüberoil GEM 1-320 N	Mobilgear XMP 320	Omala S2 GX 320	Carter EP 320
		-15 ... +30	220	Degol BG 220	Energol GR-XP 220	Alpha SP 220	Klüberoil GEM 1-220 N	Mobilgear XMP 220	Omala S2 GX 220	Carter EP 220
		-20 ... +20	150	Degol BG 150	Energol GR-XP 150	Alpha SP 150	Klüberoil GEM 1-150 N	Mobilgear XMP 150	Omala S2 GX 150	Carter EP 150
		-25... +10	100	Degol BG 100	Energol GR-XP 100	Alpha SP 100	Klüberoil GEM 1-100 N	Mobilgear XMP 100	Omala S2 GX 100	Carter EP 100
Sentetik Yağlar *Synthetic Oil* Synthetisches Öl	**CLP PG**	-10 ... +60	680	Degol GS 680	Energsyn SG-XP 680	–	Klübersynth GH 6 -680	Mobil Glygoyle 680	Omala S4 WE 680	Carter SY 680
		-20 ... +50	460	Degol GS 460	Energsyn SG-XP 460	Alphasyn PG 460	Klübersynth GH 6 -460	Mobil Glygoyle 460	Omala S4 WE 460	Carter SY 460
		-25 ... +40	320	Degol GS 320	Energsyn SG-XP 320	Alphasyn PG 320	Klübersynth GH 6 -320	Mobil Glygoyle 320	Omala S4 WE 320	Carter SY 320
		-30 ...+30	220	Degol GS 220	Energsyn SG-XP 220	Alphasyn PG 220	Klübersynth GH 6 -220	Mobil Glygoyle 30	Omala S4 WE 220	Carter SY 220
		-35 ... +20	150	Degol GS 150	Energsyn SG-XP 150	Alphasyn PG 150	Klübersynth GH 6 -150	Mobil Glygoyle 22	Omala S4 WE 150	Carter SY 150
		-40 ... +10	100	–	–	–	Klübersynth GH 6 -100	Mobil Glygoyle 100	–	–
	CLP HC	-10 ... +60	680	–	–	–	Klübersynth GEM 4-680 N	Mobil SHC Gear 680	Omala S4 GXV 680	Carter SH 680
		-20 ... +50	460	Degol PAS 460	Enersyn EP-XF 460	Alphasyn T 460	Klübersynth GEM 4-460 N	Mobil SHC Gear 460	Omala S4 GXV 460	Carter SH 460
		-30 ... +40	320	Degol PAS 320	Enersyn EP-XF 320	Alphasyn T 320	Klübersynth GEM 4-320 N	Mobil SHC Gear 320	Omala S4 GXV 320	Carter SH 320
		-40 ... +40	220	Degol PAS 220	Enersyn EP-XF 220	Alphasyn T 220	Klübersynth GEM 4-220 N	Mobil SHC Gear 220	Omala S4 GXV 220	Carter SH 220
		-40 ... +40	150	Degol PAS 150	Enersyn EP-XF 150	Alphasyn T 150	Klübersynth GEM 4-150 N	–	Omala S4 GXV 150	Carter SH 150
		-40 ... +40	100	–	–	–	Klübersynth GEM 4-100 N	–	–	–
Gıda Uyumlu Yağ *Food Grade Oil* Lebensmittelöl	**CLP NSF H1**	-30 ... +25	220	–	–	Optileb GT 220	Klüberoil 4 UH1-220 N	Mobil SHC Cibus 220	–	Nevastane SL 220
Çevre Dostu Yağ *Biodegradable Oil* Biologisch abbaubares Öl	**CLP E**	-25 ... +40	320	–	–	Tribol BioTop 1418-320	Klübersynth GEM 2-320	–	–	Carter Bio 320

	Ürün Kodu *Product Code* Produktcode	**Çalışma Sıcaklığı [°C]** *Working Temp. [°C]* Betriebstemperatur [°C]	**NLGI Sınıfı** *NLGI Grade* NLGI-Klasse	**Baz Yağı** *Base Oil* Basis Öl	**Renk** *Colour* Farbe
Mineral Gresler *Mineral Grease* Mineral-Fett	Mobil XHP 223	-20 ... +140	NLGI 3	ISO VG220	Mavi *Blue* Blau
Sentetik Gresler *Synthetic Grease* Synthetisches Fett	Mobil SHC Grease 460 WT	-30 ... +150	NLGI 1.5	ISO VG460	Kırmızı *Red* Rot
	Mobilith SHC 100	-40 ... +150	NLGI 2	ISO VG100	
	Mobilith SHC 007	-50 ... +150	NLGI 00	ISO VG460	
Gıda Uyumlu Gresler NSF H1 *Food Grade Grease NSF H1* Lebensmittelfett NSF H1	Mobil SHC Polyrex 222	-30 ... +170	NLGI 2	ISO VG220	Beyaz *White* Weiß
	Castrol Optileb™ GR 823-2	-30 ... +120	NLGI 2	ISO VG192	
Sıvı Gresler (Mineral) *Liquid Grease (Mineral)* Flüssiges Fett (Mineral)	Shell Gadus S2 V 220 00	-20 ... +100	NLGI 00	ISO VG220	Kahverengi *Brown* Braun

9.2- Changing the oil

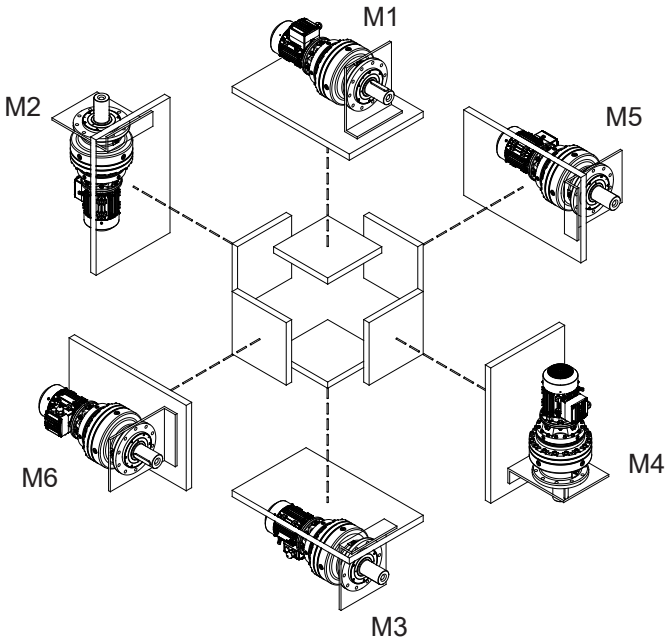
Refer to the nameplate to find out the correct oil filled inside the gearbox.

-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 9.3.

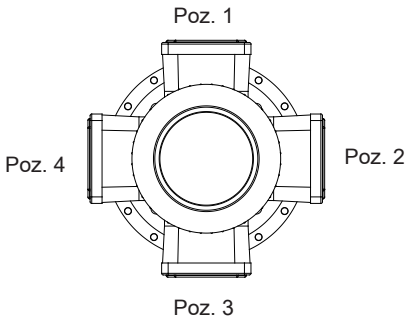
- Extended, intensive contact with oils can lead to skin irritations. Avoid extended contact with oil, and clean oil off skin thoroughly.
- Hot oil can cause scalding. When changing oil, protect yourself against contacting hot oil.

9.3 Mounting Positions

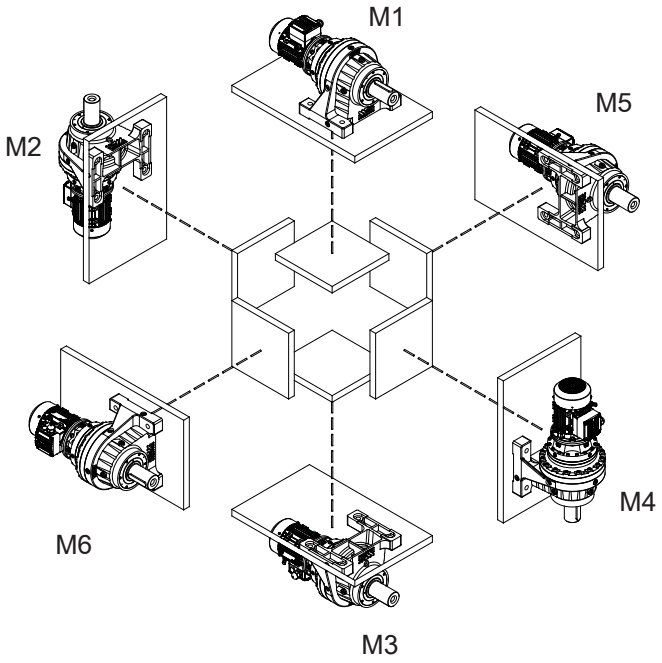
Mounting Positions of P Series with L Form



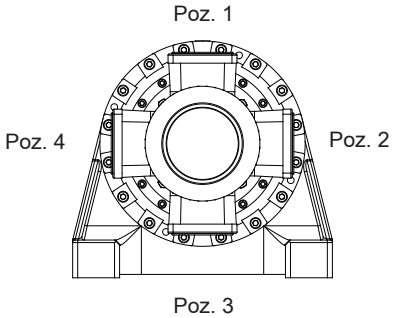
Terminal box positions are assumed as Poz 1 according to above drawings. For other positions are named by rotating clockwise direction on mounting positions when viewing back side of motor .



Mounting Positions of R Series with L Form

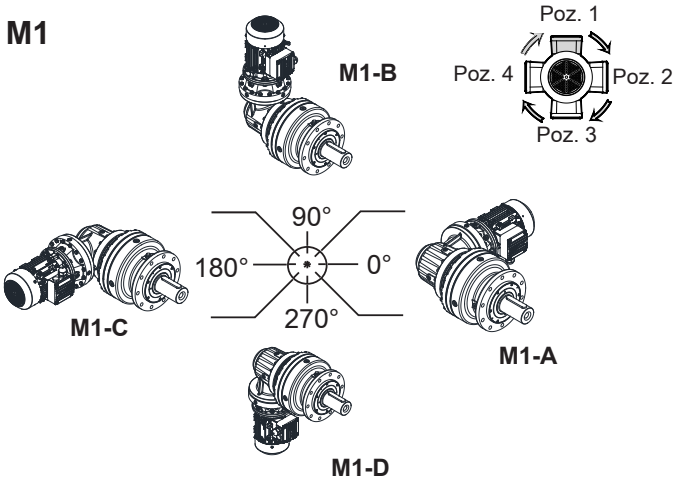


Terminal box positions are assumed as Poz 1 according to above drawings. For other positions are named by rotating clockwise direction on mounting positions when viewing back side of motor .

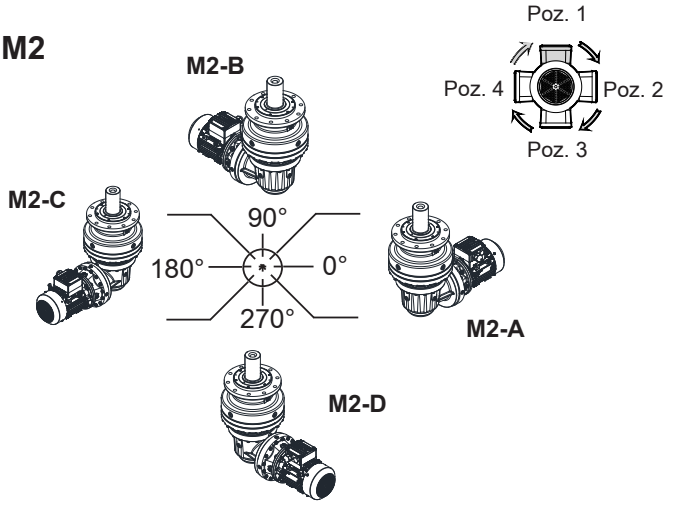


9.3.1 Mounting Position P Series with K Form

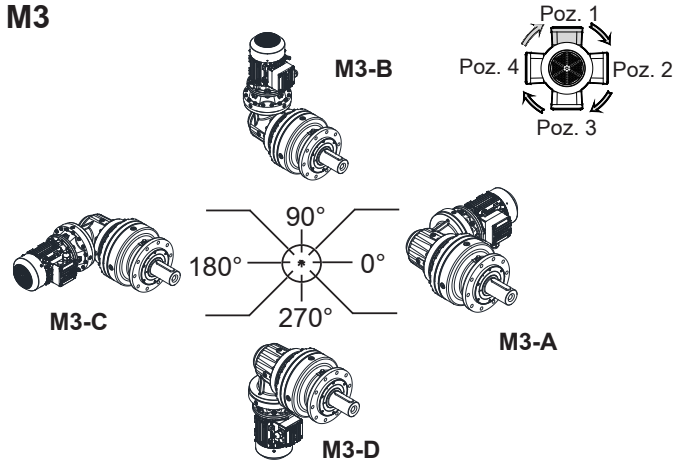
M1



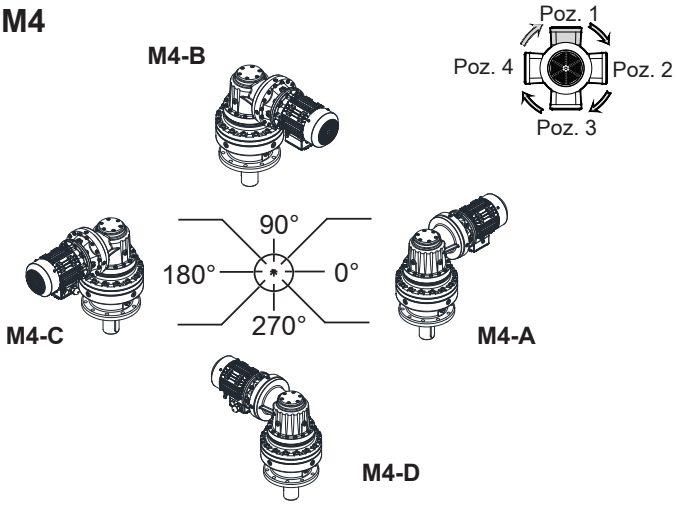
M2



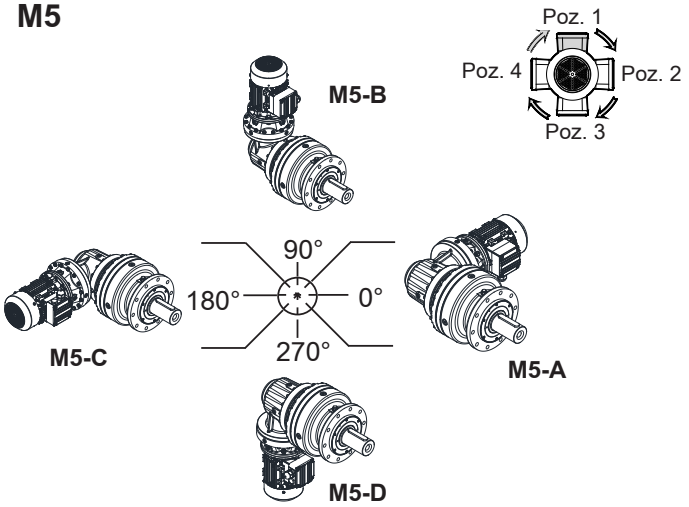
M3



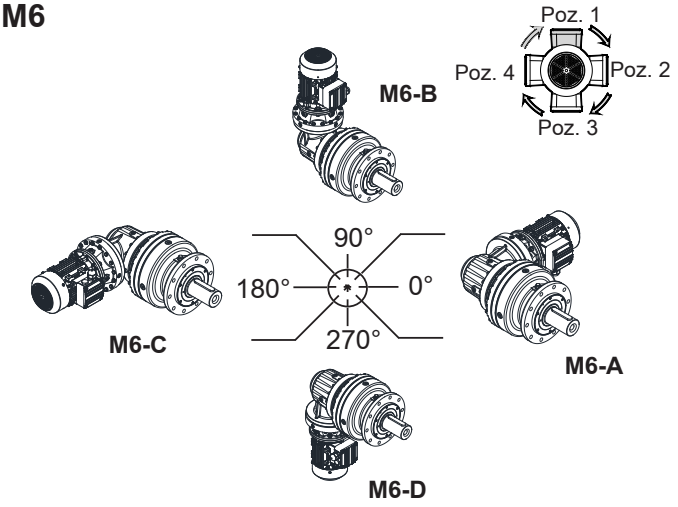
M4



M5

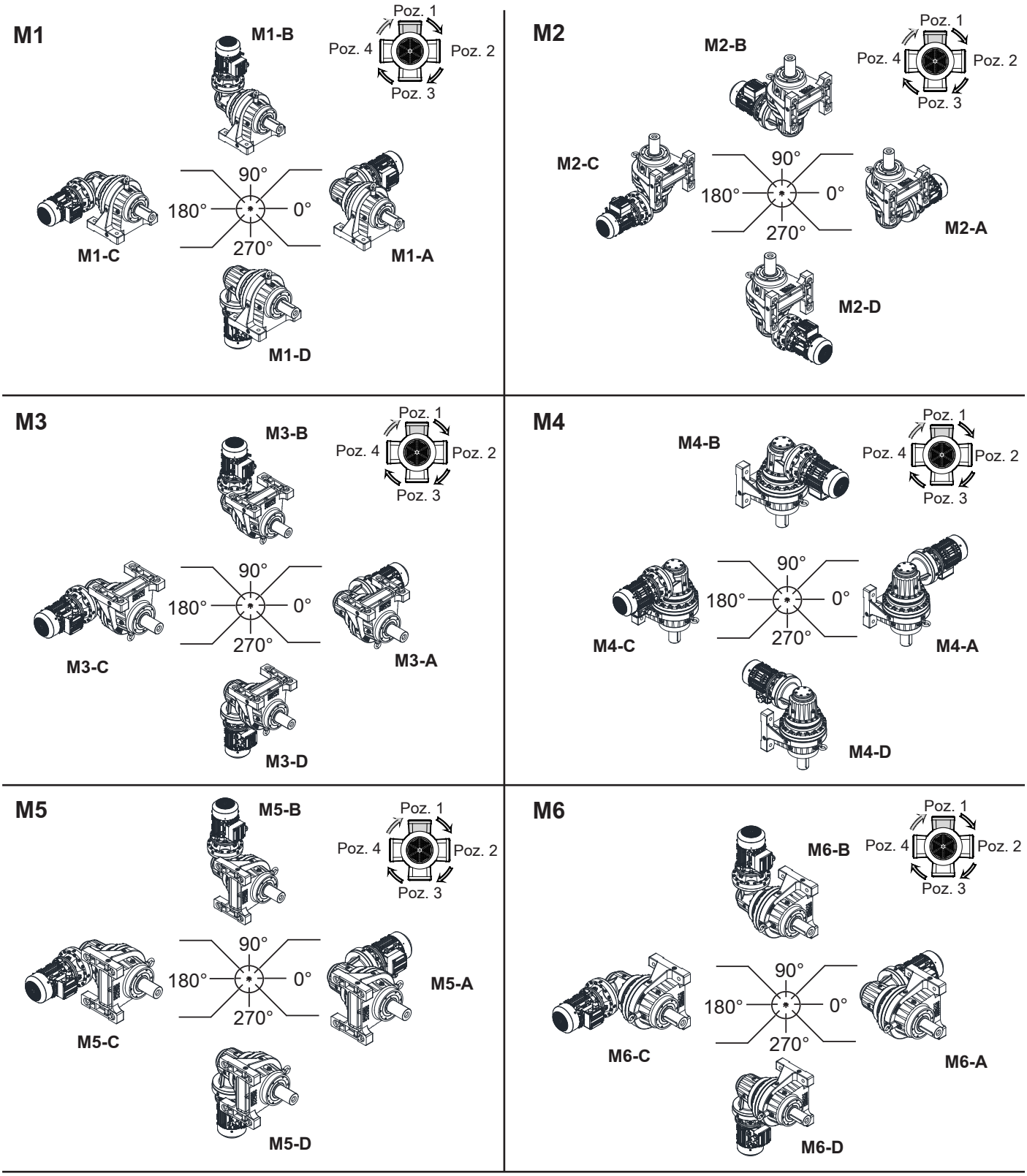


M6



Terminal box positions are assumed as Poz 1 according to above drawings. For other positions are named by rotating clockwise direction on mounting positions when viewing back side of motor .

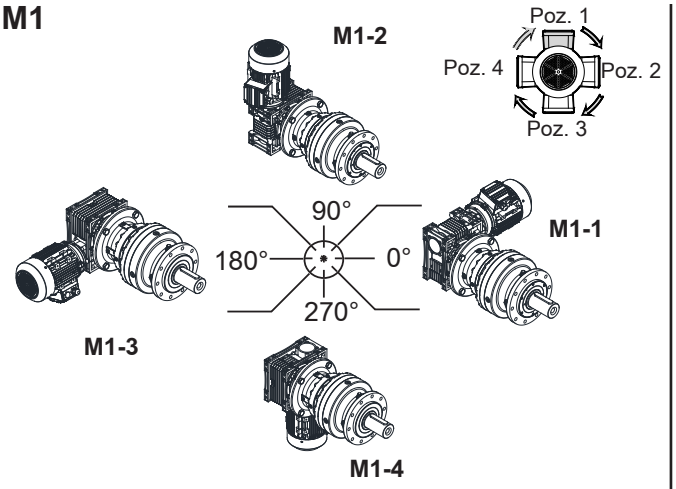
9.3.2 Mounting Positions R Series with K Form



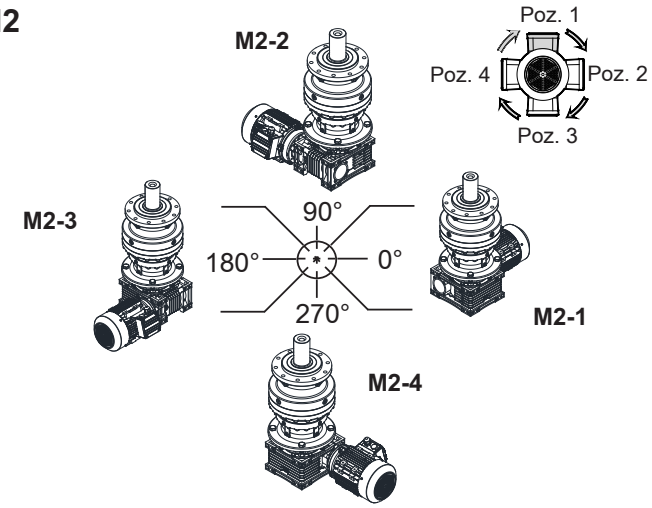
Terminal box positions are assumed as Poz 1 according to above drawings. For other positions are named by rotating clockwise direction on mounting positions when viewing back side of motor .

9.3.3 Mounting Position for P Series Combined with Worm Gear

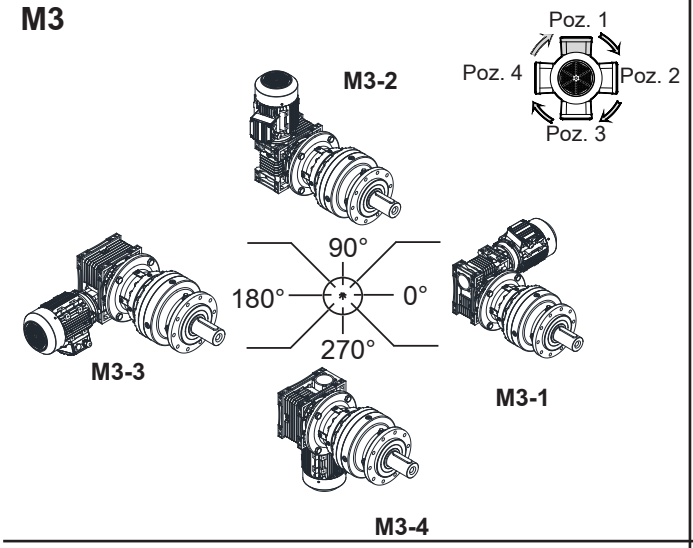
M1



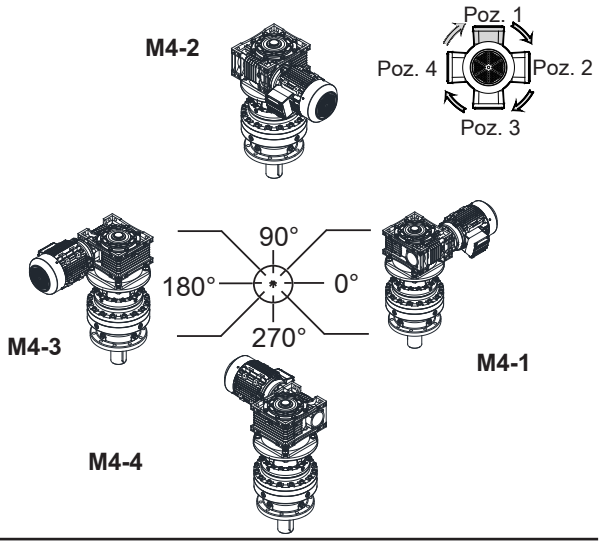
M2



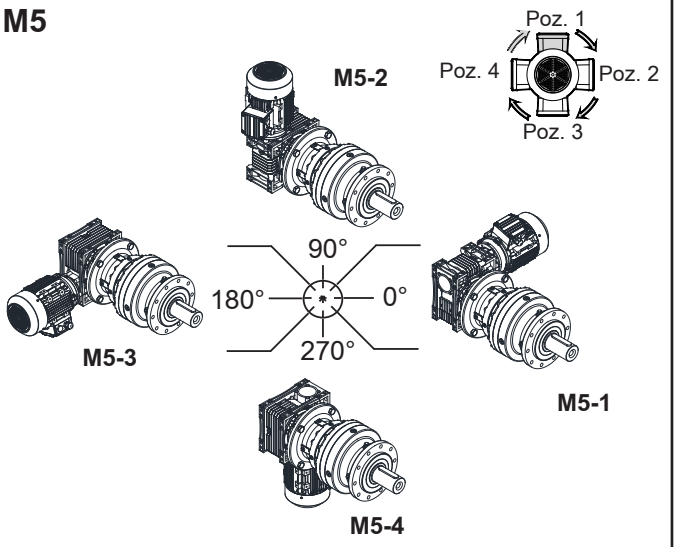
M3



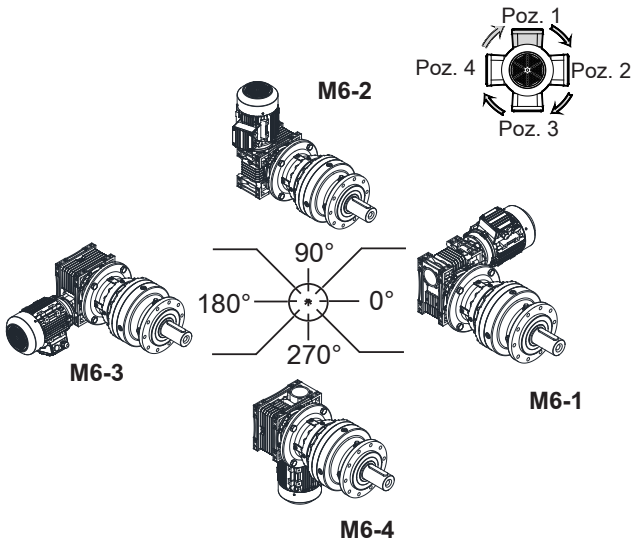
M4



M5

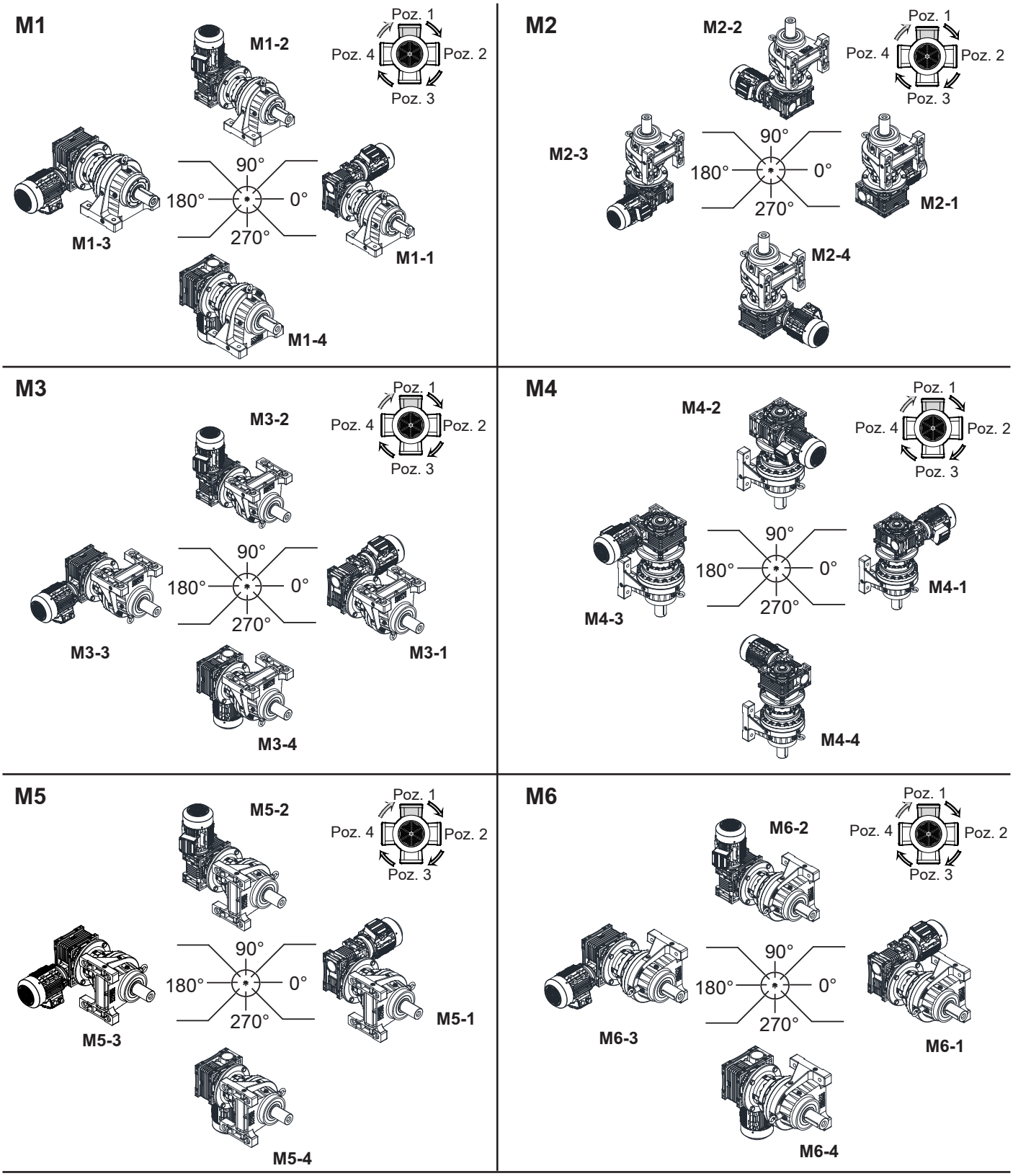


M6



Terminal box positions are assumed as Poz 1 according to above drawings. For other positions are named by rotating clockwise direction on mounting positions when viewing back side of motor .

9.3.4 Mounting Position for R Series Combined with Worm Gear



Terminal box positions are assumed as Poz 1 according to above drawings. For other positions are named by rotating clockwise direction on mounting positions when viewing back side of motor .

9.4- Oil Quantities [liter]

Gearbox	Mounting position									
	M1 - M3 - M5 - M6									
	Input Flange Options									PT / RT
	A07	A08/A09	A10/A11	A13	A16/A18	A20	A22	A25	A28	
P...1101L / R...1101L	0,60 / 0,66	0,70 / 0,77	0,75 / 0,83	0,80 / 0,88	0,70 / 0,77	-	-	-	-	0,80 / 0,88
P...1102L / R...1102L	0,90 / 0,99	0,90 / 0,99	1,2 / 1,3	1,2 / 1,3	1,2 / 1,3	-	-	-	-	1,0 / 1,1
P...1103L / R...1103L	1,3 / 1,4	1,3 / 1,4	1,4 / 1,5	1,4 / 1,5	1,4 / 1,5	-	-	-	-	1,2 / 1,3
P...1104L / R...1104L	1,6 / 1,8	1,6 / 1,8	1,7 / 1,9	1,7 / 1,9	1,7 / 1,9	-	-	-	-	1,4 / 1,6
P...1201L / R...1201L	0,62 / 0,68	0,67 / 0,73	0,80 / 0,88	0,80 / 0,88	0,80 / 0,88	-	-	-	-	0,88 / 0,97
P...1202L / R...1202L	0,92 / 1,0	1,0 / 1,1	1,2 / 1,3	1,2 / 1,3	1,2 / 1,3	-	-	-	-	1,1 / 1,2
P...1203L / R...1203L	1,2 / 1,3	1,3 / 1,4	1,3 / 1,4	1,4 / 1,5	1,4 / 1,5	-	-	-	-	1,4 / 1,5
P...1204L / R...1204L	1,8 / 2,0	1,6 / 1,8	1,6 / 1,8	1,7 / 1,9	1,7 / 1,9	-	-	-	-	1,7 / 1,9
P...1501L / R...1501L	-	-	1,2 / 1,4	1,4 / 1,5	1,4 / 1,5	2,0 / 2,2	2,0 / 2,2	-	-	1,9 / 2,1
P...1502L / R...1502L	1,4 / 1,5	1,4 / 1,5	1,5 / 1,7	1,7 / 1,9	1,7 / 1,9	-	-	-	-	1,6 / 1,8
P...1503L / R...1503L	1,8 / 2,0	1,8 / 2,0	2,0 / 2,2	2,0 / 2,2	2,0 / 2,2	-	-	-	-	1,9 / 2,1
P...1504L / R...1504L	2,1 / 2,3	2,1 / 2,3	2,1 / 2,3	2,1 / 2,3	2,1 / 2,3	-	-	-	-	2,0 / 2,2
P...1601L / R...1601L	-	-	1,3 / 1,5	1,5 / 1,7	1,5 / 1,7	2,1 / 2,4	2,1 / 2,4	-	-	2,0 / 2,2
P...1602L / R...1602L	1,6 / 1,8	1,4 / 1,6	1,5 / 1,7	1,7 / 1,9	1,7 / 1,9	-	-	-	-	1,7 / 1,9
P...1603L / R...1603L	2,2 / 2,4	1,9 / 2,1	2,0 / 2,2	2,0 / 2,2	2,0 / 2,2	-	-	-	-	2,0 / 2,2
P...1604L / R...1604L	2,3 / 2,5	2,0 / 2,2	2,1 / 2,3	2,1 / 2,3	2,1 / 2,3	-	-	-	-	2,5 / 2,8
P...1901L / R...1901L	-	-	-	-	2,8 / 3,1	2,9 / 3,2	2,3 / 2,5	2,7 / 3,0	3,0 / 3,3	3,3 / 3,6
P...1902L / R...1902L	-	-	2,3 / 2,5	2,9 / 3,2	3,0 / 3,3	3,1 / 3,4	2,5 / 2,7	-	-	3,3 / 3,6
P...1903L / R...1903L	3,1 / 3,4	3,0 / 3,3	3,0 / 3,3	3,1 / 3,4	3,3 / 3,6	-	-	-	-	3,2 / 3,5
P...1904L / R...1904L	3,4 / 3,7	3,3 / 3,6	3,3 / 3,6	3,6 / 4,0	3,8 / 4,2	-	-	-	-	3,7 / 4,1
P...2301L / R...2301L	-	-	-	-	3,1 / 3,4	3,8 / 4,2	3,5 / 3,9	4,4 / 4,8	4,8 / 5,3	4,3 / 4,7
P...2302L / R...2302L	-	-	4,0 / 4,4	4,0 / 4,4	4,2 / 4,6	5,2 / 5,7	4,8 / 5,3	-	-	3,9 / 4,3
P...2303L / R...2303L	3,8 / 4,2	4,2 / 4,6	4,4 / 4,8	4,4 / 4,8	4,5 / 5,0	-	-	-	-	4,4 / 4,8
P...2304L / R...2304L	4,1 / 4,5	4,5 / 5,0	4,7 / 5,2	4,4 / 4,8	4,5 / 5,0	-	-	-	-	4,6 / 5,1
P...2401L / R...2401L	-	-	-	-	4,9 / 5,4	4,9 / 5,4	5,0 / 5,5	5,5 / 6,1	6,1 / 6,7	4,1 / 4,5
P...2402L / R...2402L	-	-	4,1 / 4,5	4,6 / 5,1	4,9 / 5,4	4,9 / 5,4	5,0 / 5,5	-	-	5,2 / 5,7
P...2403L / R...2403L	4,1 / 4,5	4,5 / 5,0	4,6 / 5,1	5,2 / 5,7	5,5 / 6,1	-	-	-	-	5,3 / 5,8
P...2404L / R...2404L	4,9 / 5,3	5,4 / 5,9	5,8 / 6,4	5,8 / 6,4	6,1 / 6,7	-	-	-	-	5,9 / 6,5
P...2701L / R...2701L	-	-	-	-	-	5,8 / 6,4	5,9 / 6,5	6,5 / 7,1	-	4,9 / 5,3
P...2702L / R...2702L	-	-	-	-	5,8 / 6,4	5,8 / 6,4	5,9 / 6,5	6,5 / 7,1	7,1 / 7,9	6,8 / 7,5
P...2703L / R...2703L	-	-	6,3 / 6,9	7,5 / 8,3	7,5 / 8,3	7,5 / 8,3	7,6 / 8,4	-	-	7,2 / 8,0
P...2704L / R...2704L	7,5 / 8,2	8,3 / 9,1	7,2 / 7,9	8,6 / 9,5	7,9 / 8,7	-	-	-	-	7,6 / 8,4
P...2901L / R...2901L	-	-	-	-	-	-	-	-	-	7,8 / 8,6
P...2902L / R...2902L	-	-	-	-	9,4 / 10	9,5 / 10	9,5 / 10	10 / 12	12 / 13	11 / 12
P...2903L / R...2903L	-	-	11 / 12	11 / 12	11 / 12	11 / 12	11 / 12	-	-	8,6 / 9,5
P...2904L / R...2904L	10 / 11	12 / 13	12 / 13	12 / 13	13 / 14	-	-	-	-	10 / 11
P...3501L / R...3501L	-	-	-	-	-	-	-	-	-	12 / 13
P...3502L / R...3502L	-	-	-	-	11 / 13	11 / 13	14 / 15	15 / 17	17 / 18	16 / 18
P...3503L / R...3503L	-	-	13 / 14	13 / 15	13 / 15	14 / 15	16 / 18	-	-	11 / 12
P...3504L / R...3504L	12 / 13	14 / 15	14 / 15	14 / 15	14 / 15	-	-	-	-	11 / 12
P...3701L / R...3701L	-	-	-	-	-	-	-	-	-	13 / 14
P...3702L / R...3702L	-	-	-	-	-	13 / 14	15 / 17	17 / 19	-	18 / 20
P...3703L / R...3703L	-	-	-	-	15 / 17	15 / 17	18 / 20	20 / 22	22 / 24	15 / 17
P...3704L / R...3704L	-	-	16 / 17	16 / 18	16 / 18	16 / 18	19 / 21	-	-	16 / 18
P...3901L / R...3901L	-	-	-	-	-	-	-	-	-	18
P...3902L / R...3902L	-	-	-	-	-	-	-	-	-	24
P...3903L / R...3903L	-	-	-	-	17	17	21	23	25	17
P...3904L / R...3904L	-	-	17	18	18	18	22	-	-	19
P...4101L / R...4101L	-	-	-	-	-	-	-	-	-	20
P...4102L / R...4102L	-	-	-	-	-	-	-	-	-	27
P...4103L / R...4103L	-	-	-	-	20	20	23	26	28	20
P...4104L / R...4104L	-	-	20	20	20	20	24	-	-	21

The oil quantities in the table are given for the .01 - .1K - .1L output options. For oil quantities in other output options, please consult us.

9.4- Oil Quantities [liter]

Gearbox	Mounting position									
	M2									
	Input Flange Options									PT / RT
	A07	A08/A09	A10/A11	A13	A16/A18	A20	A22	A25	A28	
P...1101L / R...1101L	0,86 / 0,95	0,95 / 1,0	1,0 / 1,1	0,95 / 1,0	1,0 / 1,1	-	-	-	-	1,1 / 1,3
P...1102L / R...1102L	1,3 / 1,4	1,4 / 1,5	1,6 / 1,8	1,9 / 2,1	2,0 /2,2	-	-	-	-	1,7 / 1,8
P...1103L / R...1103L	1,9 / 2,1	2,1 / 2,3	2,4 / 2,6	2,9 / 3,1	3,0 / 3,3	-	-	-	-	2,6 / 2,8
P...1104L / R...1104L	1,9 / 2,1	2,1 / 2,3	2,4 / 2,6	2,9 / 3,1	3,0 / 3,3	-	-	-	-	2,5 /2,7
P...1201L / R...1201L	0,86 / 0,95	0,95 / 1,05	1,0 / 1,1	1,0 / 1,1	1,0 / 1,1	-	-	-	-	1,1 / 1,2
P...1202L / R...1202L	1,3 / 1,4	1,4 / 1,5	1,6 / 1,8	1,9 / 2,1	2,0 / 2,2	-	-	-	-	1,8 / 2,0
P...1203L / R...1203L	2,0 / 2,1	2,1 / 2,3	2,4 / 2,6	2,9 / 3,1	3,0 / 3,3	-	-	-	-	3,0 / 3,3
P...1204L / R...1204L	2,6 / 2,9	2,8 / 3,1	3,2 / 3,5	3,8 / 4,2	3,3 / 3,6	-	-	-	-	3,3 / 3,6
P...1501L / R...1501L	-	-	1,9 / 2,1	1,9 / 2,1	1,9 / 2,1	2,1 / 2,3	2,1 / 2,3	-	-	2,0 / 2,2
P...1502L / R...1502L	1,8 / 2,0	2,3 / 2,5	2,3 / 2,5	2,3 / 2,5	2,3 / 2,5	-	-	-	-	2,2 / 2,4
P...1503L / R...1503L	2,2 / 2,4	2,7 / 3,0	3,0 / 3,3	3,0 / 3,3	3,0 / 3,3	-	-	-	-	2,9 / 3,1
P...1504L / R...1504L	2,6 / 2,9	3,2 / 3,5	3,5 / 3,9	3,5 / 3,9	3,5 / 3,9	-	-	-	-	3,3 / 3,7
P...1601L / R...1601L	-	-	2,0 / 2,2	2,0 / 2,2	2,0 / 2,2	2,3 / 2,5	2,3 / 2,5	-	-	2,2 / 2,4
P...1602L / R...1602L	2,1 / 2,3	2,3 / 2,6	2,5 / 2,8	2,9 / 3,1	2,6 / 2,9	-	-	-	-	2,6 / 2,9
P...1603L / R...1603L	2,5 / 2,8	2,8 / 3,1	3,0 / 3,3	3,1 / 3,4	3,0 / 3,3	-	-	-	-	3,0 / 3,3
P...1604L / R...1604L	3,2 / 3,6	3,6 / 4,0	3,9 / 4,2	4,0 / 4,4	3,9 / 4,2	-	-	-	-	3,5 / 3,9
P...1901L / R...1901L	-	-	-	-	3,4 / 3,7	3,7 / 4,1	3,9 / 4,2	4,2 / 4,7	4,7 / 5,1	5,1 / 5,6
P...1902L / R...1902L	-	-	3,9 / 4,3	4,4 / 4,8	4,2 / 4,6	4,6 / 5,1	4,6 / 5,1	-	-	4,8 / 5,3
P...1903L / R...1903L	3,4 / 3,8	3,8 / 4,2	4,0 / 4,4	4,5 / 5,0	4,3 / 4,7	-	-	-	-	4,8 / 5,3
P...1904L / R...1904L	3,6 / 4,0	4,0 / 4,4	4,2 / 4,6	4,7 / 5,2	4,5 / 5,0	-	-	-	-	4,4 / 4,8
P...2301L / R...2301L	-	-	-	-	4,0 / 4,4	4,4 / 4,8	4,4 / 4,8	4,8 / 5,3	5,3 / 5,9	6,7 / 7,3
P...2302L / R...2302L	-	-	4,9 / 5,3	4,9 / 5,3	5,0 / 5,5	5,5 / 6,1	5,5 / 6,1	-	-	5,7 / 6,2
P...2303L / R...2303L	4,4 / 4,9	4,9 / 5,4	4,9 / 5,4	4,9 / 5,4	6,5 / 7,2	-	-	-	-	6,6 / 7,3
P...2304L / R...2304L	5,4 / 5,9	6,0 / 6,6	6,0 / 6,6	6,3 / 6,9	6,6 / 7,3	-	-	-	-	5,4 / 6,0
P...2401L / R...2401L	-	-	-	-	4,4 / 4,8	4,8 / 5,3	4,8 / 5,3	5,3 / 5,8	5,8 / 6,4	7,3 / 8,0
P...2402L / R...2402L	-	-	6,2 / 6,8	6,2 / 6,8	5,6 / 6,2	6,2 / 6,8	6,2 / 6,8	-	-	6,5 / 7,1
P...2403L / R...2403L	5,2 / 5,7	5,8 / 6,4	6,2 / 6,8	6,2 / 6,8	7,0 / 7,7	-	-	-	-	6,7 / 7,4
P...2404L / R...2404L	6,7 / 7,4	7,5 / 8,2	8,0 / 8,8	8,0 / 8,8	9,0 / 9,9	-	-	-	-	8,7 / 9,6
P...2701L / R...2701L	-	-	-	-	-	7,9 / 8,7	7,9 / 8,7	8,7 / 9,6	-	8,8 / 9,6
P...2702L / R...2702L	-	-	-	-	7,0 / 8	10 / 11	10 / 11	11 / 12	12 / 13	8,5 / 9,4
P...2703L / R...2703L	-	-	10 / 11	10 / 11	9,0 / 10	13 / 14	13 / 14	-	-	9,1 / 10
P...2704L / R...2704L	11 / 12	12 / 13	13 / 14	13 / 14	9,0 / 10	-	-	-	-	11 / 12
P...2901L / R...2901L	-	-	-	-	-	-	-	-	-	14 / 15
P...2902L / R...2902L	-	-	-	-	8,0 / 9	12 / 13	12 / 13	13 / 14	14 / 15	14 / 15
P...2903L / R...2903L	-	-	11 / 13	11 / 13	10 / 11	15 / 16	15 / 16	-	-	11 / 13
P...2904L / R...2904L	12 / 14	14 / 15	15 / 16	15 / 16	15 / 17	-	-	-	-	15 / 18
P...3501L / R...3501L	-	-	-	-	-	-	-	-	-	18 / 20
P...3502L / R...3502L	-	-	-	-	10 / 11	13 / 14	13 / 14	14 / 15	15 / 17	20 / 22
P...3503L / R...3503L	-	-	14 / 16	14 / 16	13 / 14	16 / 18	16 / 18	-	-	14 / 15
P...3504L / R...3504L	15 / 17	17 / 19	18 / 20	18 / 20	19 / 21	-	-	-	-	16 / 18
P...3701L / R...3701L	-	-	-	-	-	-	-	-	-	20 / 21
P...3702L / R...3702L	-	-	-	-	-	19 / 21	23 / 25	25 / 28	-	27 / 29
P...3703L / R...3703L	-	-	-	-	23 / 25	23 / 25	27 / 30	30 / 33	33 / 36	23 / 25
P...3704L / R...3704L	-	-	24 / 26	24 / 26	24 / 26	24 / 26	29 / 32	-	-	24 / 26
P...3901L / R...3901L	-	-	-	-	-	-	-	-	-	26
P...3902L / R...3902L	-	-	-	-	-	-	-	-	-	36
P...3903L / R...3903L	-	-	-	-	26	26	31	34	38	26
P...3904L / R...3904L	-	-	26	27	27	27	32	-	-	28
P...4101L / R...4101L	-	-	-	-	-	-	-	-	-	30
P...4102L / R...4102L	-	-	-	-	-	-	-	-	-	41
P...4103L / R...4103L	-	-	-	-	29	29	35	39	42	29
P...4104L / R...4104L	-	-	29	31	31	31	37	-	-	32

The oil quantities in the table are given for the .01 - .1K - .1L output options. For oil quantities in other output options, please consult us.

9.4- Oil Quantities [liter]

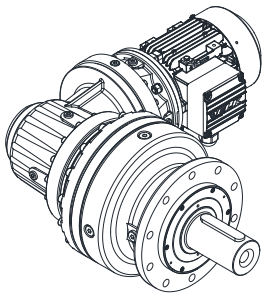
Gearbox	Mounting position									
	M4									
	Input Flange Options									PT / RT
	A07	A08/A09	A10/A11	A13	A16/A18	A20	A22	A25	A28	
P...1101L / R...1101L	0,95 / 1,0	1,1 / 1,2	1,1 / 1,2	1,1 / 1,2	1,1 / 1,2	-	-	-	-	1,3 / 1,4
P...1102L / R...1102L	1,5 / 1,7	1,5 / 1,7	1,7 / 1,9	1,7 / 1,9	1,8 / 2,0	-	-	-	-	1,5 / 1,6
P...1103L / R...1103L	2,0 / 2,2	2,2 / 2,4	2,2 / 2,4	2,2 / 2,4	2,3 / 2,6	-	-	-	-	2,0 / 2,2
P...1104L / R...1104L	2,5 / 2,8	2,8 / 3,1	2,8 / 3,1	2,8 / 3,1	3,0 / 3,3	-	-	-	-	2,4 / 2,7
P...1201L / R...1201L	0,86 / 0,94	0,94 / 1,0	0,94 / 1,0	1,0 / 1,1	1,0 / 1,1	-	-	-	-	1,4 / 1,5
P...1202L / R...1202L	1,4 / 1,5	1,5 / 1,7	1,5 / 1,7	1,6 / 1,8	1,6 / 1,8	-	-	-	-	1,6 / 1,8
P...1203L / R...1203L	2,1 / 2,3	2,3 / 2,5	2,3 / 2,5	2,5 / 2,7	2,5 / 2,7	-	-	-	-	2,3 / 2,6
P...1204L / R...1204L	2,7 / 3,0	2,9 / 3,2	2,9 / 3,2	3,1 / 3,4	3,1 / 3,4	-	-	-	-	2,9 / 3,2
P...1501L / R...1501L	-	-	2,2 / 2,4	2,2 / 2,4	2,2 / 2,4	2,4 / 2,7	2,4 / 2,7	-	-	2,3 / 2,5
P...1502L / R...1502L	2,4 / 2,7	2,7 / 3,0	2,7 / 3,0	2,7 / 3,0	2,7 / 3,0	-	-	-	-	2,5 / 2,8
P...1503L / R...1503L	2,9 / 3,2	3,2 / 3,5	3,2 / 3,5	3,2 / 3,5	3,2 / 3,5	-	-	-	-	3,0 / 3,3
P...1504L / R...1504L	3,4 / 3,8	3,8 / 4,2	3,8 / 4,2	3,8 / 4,2	3,8 / 4,2	-	-	-	-	3,6 / 4,0
P...1601L / R...1601L	-	-	2,3 / 2,5	2,3 / 2,5	2,3 / 2,5	2,6 / 2,9	2,6 / 2,9	-	-	2,4 / 2,7
P...1602L / R...1602L	2,6 / 2,8	2,9 / 3,2	2,9 / 3,2	2,9 / 3,2	2,9 / 3,2	-	-	-	-	2,9 / 3,2
P...1603L / R...1603L	3,1 / 3,4	3,4 / 3,7	3,4 / 3,7	3,4 / 3,7	3,4 / 3,7	-	-	-	-	3,4 / 3,7
P...1604L / R...1604L	3,6 / 4,0	4,0 / 4,4	4,0 / 4,4	4,0 / 4,4	4,0 / 4,4	-	-	-	-	4,8 / 5,2
P...1901L / R...1901L	-	-	-	-	4,0 / 4,4	4,4 / 4,8	4,4 / 4,8	4,8 / 5,3	5,3 / 5,9	5,9 / 6,4
P...1902L / R...1902L	-	-	4,9 / 5,4	4,9 / 5,4	5,0 / 5,5	5,5 / 6,1	5,5 / 6,1	-	-	5,9 / 6,4
P...1903L / R...1903L	4,8 / 5,2	5,3 / 5,8	5,6 / 6,2	5,6 / 6,2	5,6 / 6,2	-	-	-	-	5,4 / 6,0
P...1904L / R...1904L	5,7 / 6,2	6,3 / 6,9	6,9 / 7,6	6,3 / 6,9	6,3 / 6,9	-	-	-	-	6,1 / 6,7
P...2301L / R...2301L	-	-	-	-	5,6 / 6,2	5,9 / 6,5	5,9 / 6,5	6,5 / 7,2	7,2 / 7,9	7,6 / 8,4
P...2302L / R...2302L	-	-	6,8 / 7,5	6,8 / 7,5	7,0 / 7,7	7,4 / 8,1	7,4 / 8,1	-	-	6,9 / 7,6
P...2303L / R...2303L	6,8 / 7,4	7,5 / 8,3	7,6 / 8,4	7,6 / 8,4	8,0 / 8,8	-	-	-	-	8,0 / 8,8
P...2304L / R...2304L	7,2 / 7,9	8,0 / 8,8	8,1 / 8,9	8,5 / 9,4	9,0 / 9,8	-	-	-	-	9,1 / 10
P...2401L / R...2401L	-	-	-	-	6,6 / 7,2	6,9 / 7,6	6,9 / 7,6	7,6 / 8,3	8,3 / 9,2	8,8 / 9,6
P...2402L / R...2402L	7,4 / 8,1	8,2 / 9,0	8,2 / 9,0	8,2 / 9,0	8,2 / 9,0	8,9 / 9,8	8,9 / 9,8	-	-	8,9 / 9,8
P...2403L / R...2403L	7,9 / 8,7	8,8 / 9,7	8,8 / 9,7	8,8 / 9,7	8,8 / 9,7	-	-	-	-	8,8 / 9,7
P...2404L / R...2404L	8,4 / 9,2	9,3 / 10	9,7 / 11	9,7 / 11	9,7 / 11	-	-	-	-	9,4 / 10
P...2701L / R...2701L	-	-	-	-	-	10 / 11	10 / 11	11 / 12	-	11 / 12
P...2702L / R...2702L	-	-	-	-	13 / 14	13 / 14	13 / 14	14 / 15	15 / 17	14 / 16
P...2703L / R...2703L	-	-	12 / 14	13 / 14	15 / 17	15 / 17	15 / 17	-	-	15 / 17
P...2704L / R...2704L	13 / 15	15 / 16	15 / 16	15 / 17	18 / 20	-	-	-	-	15 / 17
P...2901L / R...2901L	-	-	-	-	-	-	-	-	-	17 / 18
P...2902L / R...2902L	-	-	-	-	15 / 17	15 / 17	15 / 17	21 / 23	23 / 25	21 / 23
P...2903L / R...2903L	-	-	20 / 22	20 / 22	18 / 20	18 / 20	18 / 20	-	-	17 / 19
P...2904L / R...2904L	18 / 20	20 / 22	20 / 22	20 / 22	18 / 20	-	-	-	-	19 / 21
P...3501L / R...3501L	-	-	-	-	-	-	-	-	-	22 / 24
P...3502L / R...3502L	-	-	-	-	17 / 19	18 / 19	22 / 24	24 / 27	27 / 29	25 / 28
P...3503L / R...3503L	-	-	26 / 29	21 / 23	20 / 22	21 / 23	26 / 29	-	-	27 / 29
P...3504L / R...3504L	24 / 26	27 / 29	27 / 29	25 / 28	25 / 28	26 / 28	-	-	-	27 / 29
P...3701L / R...3701L	-	-	-	-	-	-	-	-	-	23 / 25
P...3702L / R...3702L	-	-	-	-	-	23 / 25	28 / 31	30 / 33	-	29 / 32
P...3703L / R...3703L	-	-	-	-	29 / 32	29 / 32	32 / 35	36 / 40	40 / 44	27 / 30
P...3704L / R...3704L	-	-	30 / 33	30 / 33	30 / 33	30 / 33	35 / 39	-	-	30 / 33
P...3901L / R...3901L	-	-	-	-	-	-	-	-	-	31
P...3902L / R...3902L	-	-	-	-	-	-	-	-	-	43
P...3903L / R...3903L	-	-	-	-	31	31	37	41	46	31
P...3904L / R...3904L	-	-	31	32	32	32	38	-	-	34
P...4101L / R...4101L	-	-	-	-	-	-	-	-	-	36
P...4102L / R...4102L	-	-	-	-	-	-	-	-	-	50
P...4103L / R...4103L	-	-	-	-	35	35	42	46	50	35
P...4104L / R...4104L	-	-	35	37	37	37	44	-	-	38

The oil quantities in the table are given for the .01 - .1K - .1L output options. For oil quantities in other output options, please consult us.

9.4- Oil Quantities [liter]

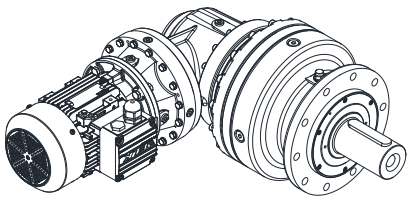
Gearbox	Mounting position									
	M1 / M3 / M5 / M6 - A / C									
	Input Flange Options									PT / RT
	A07	A08/A09	A10/A11	A13	A16/A18	A20	A22	A25	A28	
P...1102K / R...1102K	1,2 / 1,3	1,2 / 1,3	1,6 / 1,8	1,6 / 1,8	1,6 / 1,8	-	-	-	-	1,4 / 1,5
P...1103K / R...1103K	1,8 / 1,9	1,8 / 1,9	1,9 / 2,1	1,9 / 2,1	1,9 / 2,1	-	-	-	-	1,6 / 1,7
P...1104K / R...1104K	2,2 / 2,4	2,2 / 2,4	2,3 / 2,6	2,3 / 2,6	2,3 / 2,6	-	-	-	-	1,9 / 2,1
P...1201K / R...1201K	1,2 / 1,4	1,4 / 1,5	1,6 / 1,8	1,6 / 1,8	1,6 / 1,8	-	-	-	-	1,5 / 1,6
P...1203K / R...1203K	1,6 / 1,8	1,8 / 1,9	1,8 / 1,9	1,9 / 2,1	1,9 / 2,1	-	-	-	-	1,9 / 2,1
P...1204K / R...1204K	2,4 / 2,7	2,2 / 2,4	2,2 / 2,4	2,3 / 2,6	2,3 / 2,6	-	-	-	-	2,3 / 2,6
P...1502K / R...1502K	1,8 / 2,0	1,8 / 2,0	2,0 / 2,2	2,2 / 2,4	2,2 / 2,4	-	-	-	-	2,1 / 2,3
P...1503K / R...1503K	2,3 / 2,6	2,3 / 2,6	2,6 / 2,9	2,6 / 2,9	2,6 / 2,9	-	-	-	-	2,5 / 2,7
P...1504K / R...1504K	2,7 / 3,0	2,7 / 3,0	2,7 / 3,0	2,7 / 3,0	2,7 / 3,0	-	-	-	-	2,6 / 2,9
P...1602K / R...1602K	2,1 / 2,3	1,9 / 2,0	2,0 / 2,1	2,2 / 2,4	2,2 / 2,4	-	-	-	-	2,2 / 2,4
P...1603K / R...1603K	2,8 / 3,1	2,5 / 2,7	2,6 / 2,9	2,6 / 2,9	2,6 / 2,9	-	-	-	-	2,6 / 2,9
P...1604K / R...1604K	3,0 / 3,3	2,6 / 2,9	2,7 / 3,0	2,7 / 3,0	2,7 / 3,0	-	-	-	-	3,3 / 3,6
P...1902K / R...1902K	-	-	3,0 / 3,3	3,8 / 4,1	3,9 / 4,3	4,0 / 4,4	3,3 / 3,6	-	-	4,3 / 4,7
P...1903K / R...1903K	4,0 / 4,4	3,9 / 4,3	3,9 / 4,3	4,0 / 4,4	4,3 / 4,7	-	-	-	-	4,2 / 4,6
P...1904K / R...1904K	4,4 / 4,9	4,3 / 4,7	4,3 / 4,7	4,7 / 5,1	5,0 / 5,5	-	-	-	-	4,8 / 5,3
P...2302K / R...2302K	-	-	4,6 / 5,1	4,6 / 5,1	4,8 / 5,3	6,0 / 6,6	5,5 / 6,1	-	-	4,5 / 4,9
P...2303K / R...2303K	4,4 / 4,8	4,8 / 5,3	5,1 / 5,6	5,1 / 5,6	5,2 / 5,7	-	-	-	-	5,1 / 5,6
P...2304K / R...2304K	4,7 / 5,1	5,2 / 5,7	5,4 / 5,9	5,1 / 5,6	5,2 / 5,7	-	-	-	-	5,3 / 5,8
P...2402K / R...2402K	-	-	4,7 / 5,2	5,3 / 5,9	5,6 / 6,2	5,6 / 6,2	5,8 / 6,3	-	-	6,0 / 6,6
P...2403K / R...2403K	4,7 / 5,1	5,2 / 5,7	5,3 / 5,8	6,0 / 6,6	6,3 / 7,0	-	-	-	-	6,1 / 6,7
P...2404K / R...2404K	5,6 / 6,1	6,2 / 6,8	6,7 / 7,3	6,7 / 7,3	7,1 / 7,8	-	-	-	-	6,8 / 7,5
P...2702K / R...2702K	-	-	-	-	8,1 / 8,9	8,1 / 8,9	8,3 / 9,1	9,1 / 10	10 / 11	9,5 / 11
P...2703K / R...2703K	-	-	8,8 / 9,7	11 / 12	11 / 12	11 / 12	11 / 12	-	-	10 / 11
P...2704K / R...2704K	10 / 12	12 / 13	10 / 11	12 / 13	11 / 12	-	-	-	-	11 / 12
P...2902K / R...2902K	-	-	-	-	13 / 14	13 / 15	13 / 15	15 / 16	16 / 18	15 / 17
P...2903K / R...2903K	-	-	15 / 16	15 / 16	15 / 17	16 / 17	16 / 17	-	-	12 / 13
P...2904K / R...2904K	14 / 16	16 / 18	16 / 18	16 / 18	18 / 19	-	-	-	-	14 / 15
P...3502K / R...3502K	-	-	-	-	16 / 18	16 / 18	19 / 21	21 / 23	23 / 26	22 / 24
P...3503K / R...3503K	-	-	18 / 20	19 / 21	19 / 21	19 / 21	23 / 25	-	-	15 / 16
P...3504K / R...3504K	17 / 19	19 / 21	19 / 21	20 / 22	20 / 22	-	-	-	-	15 / 17
P...3703K / R...3703K	-	-	-	-	20 / 21	20 / 21	23 / 26	26 / 28	28 / 31	20 / 21
P...3704K / R...3704K	-	-	21 / 23	21 / 23	21 / 23	21 / 23	25 / 27	-	-	21 / 23
P...3903K / R...3903K	-	-	-	-	22	22	27	30	33	22
P...3904K / R...3904K	-	-	23	23	23	23	28	-	-	24
P...4103K / R...4103K	-	-	-	-	25	25	30	33	37	25
P...4104K / R...4104K	-	-	26	27	27	27	32	-	-	27

PV1502K.01



M1-A

PV1502K.01



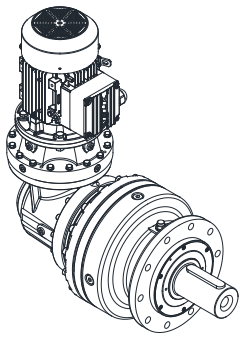
M1-C

The oil quantities in the table are given for the .01 - .1K - .1L output options. For oil quantities in other output options, please consult us.

9.4- Oil Quantities [liter]

Gearbox	Mounting position									
	M1 / M3 / M5 / M6 - B									
	Input Flange Options									PT / RT
	A07	A08/A09	A10/A11	A13	A16/A18	A20	A22	A25	A28	
P...1102K / R...1102K	0,97 / 1,1	0,97 / 1,1	1,3 / 1,4	1,3 / 1,4	1,3 / 1,4	-	-	-	-	1,1 / 1,2
P...1103K / R...1103K	1,4 / 1,5	1,4 / 1,5	1,5 / 1,7	1,5 / 1,7	1,5 / 1,7	-	-	-	-	1,3 / 1,4
P...1104K / R...1104K	1,7 / 1,9	1,7 / 1,9	1,9 / 2,0	1,9 / 2,0	1,9 / 2,0	-	-	-	-	1,6 / 1,7
P...1201K / R...1201K	1,1 / 1,2	1,2 / 1,3	1,4 / 1,5	1,4 / 1,5	1,4 / 1,5	-	-	-	-	1,3 / 1,4
P...1203K / R...1203K	1,4 / 1,5	1,5 / 1,6	1,5 / 1,6	1,6 / 1,8	1,6 / 1,8	-	-	-	-	1,6 / 1,8
P...1204K / R...1204K	2,1 / 2,3	1,8 / 2,0	1,8 / 2,0	2,0 / 2,2	2,0 / 2,2	-	-	-	-	2,0 / 2,2
P...1502K / R...1502K	1,6 / 1,8	1,6 / 1,8	1,7 / 1,9	2,0 / 2,2	2,0 / 2,2	-	-	-	-	1,8 / 2,0
P...1503K / R...1503K	2,1 / 2,3	2,1 / 2,3	2,3 / 2,5	2,3 / 2,5	2,3 / 2,5	-	-	-	-	2,2 / 2,4
P...1504K / R...1504K	2,4 / 2,7	2,4 / 2,7	2,4 / 2,7	2,4 / 2,7	2,4 / 2,7	-	-	-	-	2,3 / 2,5
P...1602K / R...1602K	1,9 / 2,1	1,6 / 1,8	1,7 / 1,9	2,0 / 2,2	2,0 / 2,2	-	-	-	-	2,0 / 2,2
P...1603K / R...1603K	2,5 / 2,8	2,2 / 2,4	2,3 / 2,5	2,3 / 2,5	2,3 / 2,5	-	-	-	-	2,3 / 2,5
P...1604K / R...1604K	2,6 / 2,9	2,3 / 2,5	2,4 / 2,7	2,4 / 2,7	2,4 / 2,7	-	-	-	-	2,9 / 3,2
P...1902K / R...1902K	-	-	2,6 / 2,9	3,3 / 3,7	3,5 / 3,8	3,6 / 3,9	2,9 / 3,2	-	-	3,8 / 4,2
P...1903K / R...1903K	3,6 / 3,9	3,5 / 3,8	3,5 / 3,8	3,6 / 3,9	3,8 / 4,2	-	-	-	-	3,7 / 4,0
P...1904K / R...1904K	3,9 / 4,3	3,8 / 4,2	3,8 / 4,2	4,1 / 4,6	4,4 / 4,8	-	-	-	-	4,3 / 4,7
P...2302K / R...2302K	-	-	4,3 / 4,7	4,3 / 4,7	4,5 / 4,9	5,6 / 6,1	5,1 / 5,6	-	-	4,2 / 4,6
P...2303K / R...2303K	4,4 / 4,8	4,8 / 5,3	5,1 / 5,6	5,1 / 5,6	5,2 / 5,7	-	-	-	-	5,1 / 5,6
P...2304K / R...2304K	4,7 / 5,1	5,2 / 5,7	5,4 / 5,9	5,1 / 5,6	5,2 / 5,7	-	-	-	-	5,3 / 5,8
P...2402K / R...2402K	-	-	4,4 / 4,8	5,0 / 5,5	5,2 / 5,8	5,2 / 5,8	5,4 / 5,9	-	-	5,6 / 6,1
P...2403K / R...2403K	4,3 / 4,8	4,8 / 5,3	4,9 / 5,4	5,6 / 6,1	5,9 / 6,5	-	-	-	-	5,7 / 6,2
P...2404K / R...2404K	5,2 / 5,7	5,8 / 6,4	6,2 / 6,8	6,2 / 6,8	6,6 / 7,2	-	-	-	-	6,3 / 7,0
P...2702K / R...2702K	-	-	-	-	6,8 / 7,5	6,8 / 7,5	7,0 / 7,7	7,7 / 8,4	8,4 / 9,3	8,0 / 8,8
P...2703K / R...2703K	-	-	7,4 / 8,2	8,9 / 9,7	8,9 / 9,7	8,9 / 9,7	9,0 / 9,9	-	-	8,5 / 9,4
P...2704K / R...2704K	8,8 / 9,7	9,8 /11	8,5 / 9,3	10 / 11	9,3 / 10	-	-	-	-	9,0 / 9,9
P...2902K / R...2902K	-	-	-	-	11 / 12	11 / 12	11 / 12	12 / 13	13 / 15	13 / 14
P...2903K / R...2903K	-	-	12 / 13	12 / 13	13 / 14	13 / 14	13 / 14	-	-	10 / 11
P...2904K / R...2904K	12 / 13	13 / 15	13 / 15	13 / 15	14 / 16	-	-	-	-	11 / 12
P...3502K / R...3502K	-	-	-	-	13 / 14	13 / 15	16 / 17	17 / 19	19 / 21	18 / 20
P...3503K / R...3503K	-	-	15 / 16	15 / 17	15 / 17	16 / 17	19 / 20	-	-	12 / 13
P...3504K / R...3504K	14 / 15	16 / 17	16 / 17	16 / 18	16 / 18	-	-	-	-	13 / 14
P...3703K / R...3703K	-	-	-	-	17 / 19	17 / 19	21 / 23	23 / 25	25 / 28	17 / 19
P...3704K / R...3704K	-	-	18 / 20	19 / 21	19 / 21	18 / 20	22 / 24	-	-	18 / 20
P...3903K / R...3903K	-	-	-	-	20	20	24	26	29	20
P...3904K / R...3904K	-	-	20	21	21	21	25	-	-	21
P...4103K / R...4103K	-	-	-	-	22	22	27	30	33	22
P...4104K / R...4104K	-	-	23	23	23	23	28	-	-	24

PV1502K.01



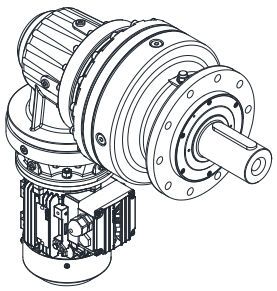
M1-B

The oil quantities in the table are given for the .01 - .1K - .1L output options. For oil quantities in other output options, please consult us.

9.4- Oil Quantities [liter]

Gearbox	Mounting position									
	M1 / M3 / M5 / M6 - D									
	Input Flange Options									PT / RT
	A07	A08/A09	A10/A11	A13	A16/A18	A20	A22	A25	A28	
P...1102K / R...1102K	1,4 / 1,6	1,4 / 1,6	1,9 / 2,1	1,9 / 2,1	1,9 / 2,1	-	-	-	-	1,6 / 1,8
P...1103K / R...1103K	2,1 / 2,3	2,1 / 2,3	2,2 / 2,5	2,2 / 2,5	2,2 / 2,5	-	-	-	-	1,9 / 2,1
P...1104K / R...1104K	2,6 / 2,8	2,6 / 2,8	2,8 / 3,0	2,8 / 3,0	2,8 / 3,0	-	-	-	-	2,3 / 2,5
P...1201K / R...1201K	1,5 / 1,6	1,6 / 1,8	1,9 / 2,1	1,9 / 2,1	1,9 / 2,1	-	-	-	-	1,8 / 1,9
P...1203K / R...1203K	1,9 / 2,1	2,1 / 2,3	2,1 / 2,3	2,2 / 2,5	2,2 / 2,5	-	-	-	-	2,2 / 2,5
P...1204K / R...1204K	2,9 / 3,2	2,6 / 2,8	2,6 / 2,8	2,8 / 3,0	2,8 / 3,0	-	-	-	-	2,8 / 3,0
P...1502K / R...1502K	2,0 / 2,2	2,0 / 2,2	2,1 / 2,3	2,4 / 2,6	2,4 / 2,6	-	-	-	-	2,2 / 2,5
P...1503K / R...1503K	2,5 / 2,8	2,5 / 2,8	2,8 / 3,1	2,8 / 3,1	2,8 / 3,1	-	-	-	-	2,7 / 2,9
P...1504K / R...1504K	2,9 / 3,2	2,9 / 3,2	2,9 / 3,2	2,9 / 3,2	2,9 / 3,2	-	-	-	-	2,8 / 3,1
P...1602K / R...1602K	2,3 / 2,5	2,0 / 2,2	2,1 / 2,3	2,4 / 2,6	2,4 / 2,6	-	-	-	-	2,4 / 2,6
P...1603K / R...1603K	3,1 / 3,4	2,7 / 2,9	2,8 / 3,1	2,8 / 3,1	2,8 / 3,1	-	-	-	-	2,8 / 3,1
P...1604K / R...1604K	3,2 / 3,5	2,8 / 3,1	2,9 / 3,2	2,9 / 3,2	2,9 / 3,2	-	-	-	-	3,5 / 3,9
P...1902K / R...1902K	-	-	3,2 / 3,5	4,1 / 4,5	4,2 / 4,6	4,3 / 4,8	3,5 / 3,9	-	-	4,6 / 5,1
P...1903K / R...1903K	4,3 / 4,8	4,2 / 4,6	4,2 / 4,6	4,3 / 4,8	4,6 / 5,1	-	-	-	-	4,5 / 4,9
P...1904K / R...1904K	4,8 / 5,2	4,6 / 5,1	4,6 / 5,1	5,0 / 5,5	5,4 / 5,9	-	-	-	-	5,2 / 5,7
P...2302K / R...2302K	-	-	5,6 / 6,2	5,6 / 6,20	5,9 / 6,5	7,3 / 8,0	6,7 / 7,4	-	-	5,5 / 6,0
P...2303K / R...2303K	5,3 / 5,8	5,9 / 6,5	6,2 / 6,8	6,2 / 6,8	6,3 / 6,9	-	-	-	-	6,2 / 6,8
P...2304K / R...2304K	5,7 / 6,2	6,3 / 6,9	6,6 / 7,2	6,2 / 6,8	6,3 / 6,9	-	-	-	-	6,4 / 7,1
P...2402K / R...2402K	-	-	5,7 / 6,3	6,5 / 7,1	6,9 / 7,5	6,9 / 7,5	7,0 / 7,7	-	-	7,3 / 8,0
P...2403K / R...2403K	5,7 / 6,2	6,3 / 6,9	6,4 / 7,1	7,3 / 8,0	7,7 / 8,3	-	-	-	-	7,4 / 8,2
P...2404K / R...2404K	6,8 / 7,5	7,6 / 8,3	8,1 / 8,9	8,1 / 8,9	8,6 / 9,4	-	-	-	-	8,3 / 9,1
P...2702K / R...2702K	-	-	-	-	8,1 / 8,9	8,1 / 8,9	8,3 / 9,1	9,1 / 10	10 / 11	9,5 / 10
P...2703K / R...2703K	-	-	8,8 / 9,7	11 / 12	11 / 12	11 / 12	11 / 12	-	-	10 / 11
P...2704K / R...2704K	10 / 12	12 / 13	10 / 11	12 / 13	11 / 12	-	-	-	-	11 / 12
P...2902K / R...2902K	-	-	-	-	13 / 14	13 / 15	13 / 15	15 / 16	16 / 18	15 / 17
P...2903K / R...2903K	-	-	15 / 16	15 / 16	15 / 17	16 / 17	16 / 17	-	-	12 / 13
P...2904K / R...2904K	14 / 16	16 / 18	16 / 18	16 / 18	18 / 19	-	-	-	-	14 / 15
P...3502K / R...3502K	-	-	-	-	16 / 18	16 / 18	19 / 21	21 / 23	23 / 26	22 / 24
P...3503K / R...3503K	-	-	18 / 20	19 / 21	19 / 21	19 / 21	23 / 25	-	-	15 / 16
P...3504K / R...3504K	17 / 19	19 / 21	19 / 21	20 / 22	20 / 22	-	-	-	-	15 / 17
P...3703K / R...3703K	-	-	-	-	21 / 23	21 / 23	25 / 28	28 / 30	30 / 34	21 / 23
P...3704K / R...3704K	-	-	22 / 24	23 / 25	23 / 25	22 / 25	27 / 29	-	-	22 / 25
P...3903K / R...3903K	-	-	-	-	24	24	29	32	35	24
P...3904K / R...3904K	-	-	24	25	25	25	30	-	-	26
P...4103K / R...4103K	-	-	-	-	27	27	33	36	40	27
P...4104K / R...4104K	-	-	28	29	29	29	34	-	-	29

PV1502K.01



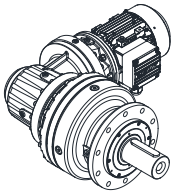
M1-D

The oil quantities in the table are given for the .01 - .1K - .1L output options. For oil quantities in other output options, please consult us.

9.4- Oil Quantities [liter]

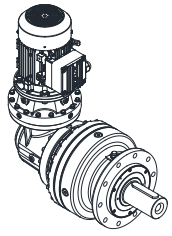
Gearbox	Mounting position									
	M2 - A / B / C / D									
	Input Flange Options									PT / RT
	A07	A08/A09	A10/A11	A13	A16/A18	A20	A22	A25	A28	
P...1102K / R...1102K	1,7 / 1,9	1,8 / 2,0	2,1 / 2,3	2,5 / 2,7	2,6 / 2,9	-	-	-	-	2,2 / 2,4
P...1103K / R...1103K	2,5 / 2,7	2,7 / 3,0	3,1 / 3,4	3,7 / 4,1	3,9 / 4,3	-	-	-	-	3,3 / 3,7
P...1104K / R...1104K	2,5 / 2,7	2,7 / 3,0	3,1 / 3,4	3,7 / 4,1	3,9 / 4,3	-	-	-	-	3,2 / 3,5
P...1201K / R...1201K	1,6 / 1,8	1,8 / 1,9	2,0 / 2,2	2,4 / 2,6	2,5 / 2,7	-	-	-	-	2,3 / 2,5
P...1203K / R...1203K	2,4 / 2,7	2,6 / 2,9	3,0 / 3,3	3,6 / 3,9	3,7 / 4,1	-	-	-	-	3,7 / 4,1
P...1204K / R...1204K	3,3 / 3,6	3,5 / 3,9	4,0 / 4,4	4,8 / 5,2	4,1 / 4,5	-	-	-	-	4,1 / 4,5
P...1502K / R...1502K	2,3 / 2,5	2,9 / 3,2	2,9 / 3,2	2,9 / 3,2	2,9 / 3,2	-	-	-	-	2,7 / 3,0
P...1503K / R...1503K	2,7 / 3,0	3,4 / 3,7	3,8 / 4,1	3,8 / 4,1	3,8 / 4,1	-	-	-	-	3,6 / 3,9
P...1504K / R...1504K	3,3 / 3,6	4,0 / 4,4	4,4 / 4,9	4,4 / 4,9	4,4 / 4,8	-	-	-	-	4,2 / 4,6
P...1602K / R...1602K	2,5 / 2,8	2,8 / 3,1	3,0 / 3,3	3,4 / 3,8	3,1 / 3,4	-	-	-	-	3,1 / 3,4
P...1603K / R...1603K	3,0 / 3,3	3,4 / 3,7	3,6 / 4,0	3,7 / 4,1	3,6 / 4,0	-	-	-	-	3,6 / 4,0
P...1604K / R...1604K	3,9 / 4,3	4,3 / 4,8	4,6 / 5,1	4,8 / 5,3	4,6 / 5,1	-	-	-	-	4,2 / 4,6
P...1902K / R...1902K	-	-	5,3 / 5,8	5,9 / 6,5	5,7 / 6,2	6,2 / 6,9	6,2 / 6,9	-	-	6,5 / 7,1
P...1903K / R...1903K	4,6 / 5,1	5,1 / 5,7	5,4 / 5,9	6,1 / 6,7	5,8 / 6,4	-	-	-	-	6,5 / 7,1
P...1904K / R...1904K	4,9 / 5,3	5,4 / 5,9	5,7 / 6,2	6,4 / 7,0	6,1 / 6,7	-	-	-	-	5,9 / 6,5
P...2302K / R...2302K	-	-	6,3 / 6,9	6,3 / 6,9	6,5 / 7,2	7,2 / 7,9	7,2 / 7,9	-	-	7,4 / 8,1
P...2303K / R...2303K	5,7 / 6,3	6,4 / 7,0	6,4 / 7,0	6,4 / 7,0	8,5 / 9,3	-	-	-	-	8,6 / 9,5
P...2304K / R...2304K	7,0 / 7,7	7,8 / 8,6	7,8 / 8,6	8,2 / 9,0	8,6 / 9,5	-	-	-	-	7,1 / 7,8
P...2402K / R...2402K			8,0 / 8,8	8,0 / 8,8	7,3 / 8,0	8,0 / 8,8	8,0 / 8,8	-	-	8,4 / 9,3
P...2403K / R...2403K	6,8 / 7,5	7,5 / 8,3	8,1 / 8,9	8,1 / 8,9	9,1 / 10	-	-	-	-	8,7 / 9,6
P...2404K / R...2404K	9 / 10	10 / 11	10 / 11	10 / 11	12 / 13	-	-	-	-	11 / 12
P...2702K / R...2702K	-	-	-	-	9 / 10	13 / 14	13 / 14	14 / 16	16 / 17	11 / 12
P...2703K / R...2703K	-	-	13 / 14	13 / 14	12 / 13	17 / 19	17 / 19	-	-	12 / 13
P...2704K / R...2704K	14 / 15	16 / 17	17 / 18	17 / 18	12 / 13	-	-	-	-	15 / 16
P...2902K / R...2902K	-	-	-	-	10 / 11	15 / 16	15 / 16	16 / 18	18 / 20	18 / 20
P...2903K / R...2903K	-	-	15 / 16	15 / 16	14 / 15	19 / 21	19 / 21	-	-	15 / 16
P...2904K / R...2904K	16 / 18	18 / 20	19 / 21	19 / 21	20 / 21	-	-	-	-	19 / 21
P...3502K / R...3502K	-	-	-	-	13 / 14	16 / 18	16 / 18	18 / 20	20 / 22	26 / 28
P...3503K / R...3503K	-	-	19 / 20	19 / 20	17 / 19	21 / 24	21 / 24	-	-	18 / 20
P...3504K / R...3504K	20 / 22	22 / 24	24 / 26	24 / 26	24 / 27	-	-	-	-	21 / 23
P...3703K / R...3703K	-	-	-	-	30 / 33	30 / 33	35 / 39	39 / 43	43 / 47	29 / 32
P...3704K / R...3704K	-	-	31 / 34	31 / 34	31 / 34	31 / 34	38 / 41	-	-	31 / 34
P...3903K / R...3903K	-	-	-	-	34	34	40	44	49	34
P...3904K / R...3904K	-	-	34	35	35	35	42	-	-	36
P...4103K / R...4103K	-	-	-	-	38	38	46	50	55	38
P...4104K / R...4104K	-	-	38	40	40	40	48	-	-	42

PV1502K.01



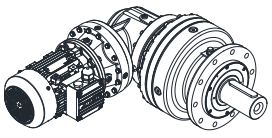
M1-A

PV1502K.01



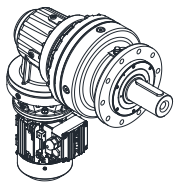
M1-B

PV1502K.01



M1-C

PV1502K.01



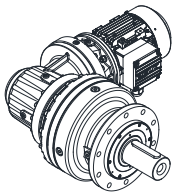
M1-D

The oil quantities in the table are given for the .01 - .1K - .1L output options. For oil quantities in other output options, please consult us.

9.4- Oil Quantities [liter]

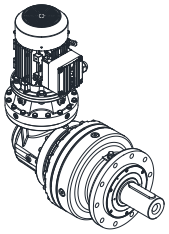
Gearbox	Mounting position									
	M4 - A / B / C / D									
	Input Flange Options									PT / RT
	A07	A08/A09	A10/A11	A13	A16/A18	A20	A22	A25	A28	
P...1102K / R...1102K	1,9 / 2,1	1,9 / 2,1	2,1 / 2,3	2,1 / 2,3	2,3 / 2,5	-	-	-	-	1,9 / 2,1
P...1103K / R...1103K	2,5 / 2,8	2,8 / 3,0	2,8 / 3,0	2,8 / 3,0	2,9 / 3,2	-	-	-	-	2,5 / 2,8
P...1104K / R...1104K	3,2 / 3,5	3,5 / 3,9	3,5 / 3,9	3,5 / 3,9	3,7 / 4,1	-	-	-	-	3,0 / 3,3
P...1201K / R...1201K	1,7 / 1,9	1,9 / 2,1	1,9 / 2,1	2,0 / 2,2	2,0 / 2,2	-	-	-	-	2,1 / 2,3
P...1203K / R...1203K	2,6 / 2,9	2,9 / 3,2	2,9 / 3,2	3,1 / 3,4	3,1 / 3,4	-	-	-	-	2,9 / 3,2
P...1204K / R...1204K	3,4 / 3,7	3,7 / 4,0	3,7 / 4,0	3,9 / 4,3	3,9 / 4,3	-	-	-	-	3,7 / 4,0
P...1502K / R...1502K	3,0 / 3,3	3,4 / 3,7	3,4 / 3,7	3,4 / 3,7	3,4 / 3,7	-	-	-	-	3,2 / 3,5
P...1503K / R...1503K	3,6 / 4,0	4,0 / 4,4	4,0 / 4,4	4,0 / 4,4	4,0 / 4,4	-	-	-	-	3,8 / 4,2
P...1504K / R...1504K	4,3 / 4,7	4,8 / 5,2	4,8 / 5,2	4,8 / 5,2	4,8 / 5,2	-	-	-	-	4,5 / 5,0
P...1602K / R...1602K	3,2 / 3,6	3,6 / 3,9	3,6 / 3,9	3,6 / 3,9	3,6 / 3,9	-	-	-	-	3,6 / 3,9
P...1603K / R...1603K	3,8 / 4,2	4,3 / 4,7	4,3 / 4,7	4,3 / 4,7	4,3 / 4,7	-	-	-	-	4,3 / 4,7
P...1604K / R...1604K	4,5 / 5,0	5,0 / 5,5	5,0 / 5,5	5,0 / 5,5	5,0 / 5,5	-	-	-	-	6,0 / 6,5
P...1902K / R...1902K	-	-	6,1 / 6,7	6,1 / 6,7	6,3 / 6,9	6,9 / 7,6	6,9 / 7,6	-	-	7,3 / 8,1
P...1903K / R...1903K	6,0 / 6,6	6,6 / 7,3	7,0 / 7,7	7,0 / 7,7	7,0 / 7,7	-	-	-	-	6,8 / 7,5
P...1904K / R...1904K	7,1 / 7,8	7,9 / 8,7	8,6 / 9,5	7,9 / 8,7	7,9 / 87	-	-	-	-	7,6 / 8,4
P...2302K / R...2302K	-	-	8,6 / 9,4	8,6 / 9,4	8,8 / 9,6	9,3 / 10	9,3 / 10	-	-	8,6 / 9,5
P...2303K / R...2303K	8,4 / 9,3	9,4 / 10	9,5 / 10	9,5 / 10	10 / 11	-	-	-	-	10 / 11
P...2304K / R...2304K	9,0 / 9,9	10 / 11	10 / 11	11 / 12	11 / 12	-	-	-	-	11 / 12
P...2402K / R...2402K	9,2 / 10	10 / 11	10 / 11	10 / 11	10 / 11	11 / 12	11 / 12	-	-	11 / 12
P...2403K / R...2403K	9,9 / 11	11 / 12	11 / 12	11 / 12	11 / 12	-	-	-	-	11 / 12
P...2404K / R...2404K	10 / 12	12 / 13	12 / 13	12 / 13	12 / 13	-	-	-	-	12 / 13
P...2702K / R...2702K	-	-	-	-	16 / 17	16 / 17	16 / 17	17 / 19	19 / 21	18 / 19
P...2703K / R...2703K	-	-	15 / 17	16 / 17	19 / 21	19 / 21	19 / 21	-	-	19 / 21
P...2704K / R...2704K	17 / 18	18 / 20	18 / 20	19 / 21	22 / 25	-	-	-	-	19 / 21
P...2902K / R...2902K	-	-	-	-	19 / 21	19 / 21	19 / 21	26 / 28	28 / 31	26 / 29
P...2903K / R...2903K	-	-	25 / 28	25 / 28	22 / 24	22 / 24	22 / 24	-	-	21 / 23
P...2904K / R...2904K	23 / 25	25 / 28	25 / 28	25 / 28	23 / 25	-	-	-	-	23 / 26
P...3502K / R...3502K	-	-	-	-	22 / 24	22 / 24	28 / 30	30 / 33	33 / 37	31 / 35
P...3503K / R...3503K	-	-	33 / 36	26 / 28	25 / 28	26 / 29	33 / 36	-	-	33 / 37
P...3504K / R...3504K	30 / 33	33 / 36	33 / 36	32 / 35	31 / 34	32 / 35	-	-	-	33 / 37
P...3703K / R...3703K	-	-	-	-	36 / 40	36 / 40	40 / 44	45 / 50	50 / 54	34 / 37
P...3704K / R...3704K	-	-	38 / 41	37 / 41	38 / 41	37 / 41	44 / 48	-	-	38 / 41
P...3903K / R...3903K	-	-	-	-	39	39	46	51	58	39
P...3904K / R...3904K	-	-	39	40	40	40	48	-	-	43
P...4103K / R...4103K	-	-	-	-	44	44	52	58	63	44
P...4104K / R...4104K	-	-	44	46	46	46	55	-	-	48

PV1502K.01



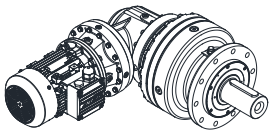
M1-A

PV1502K.01



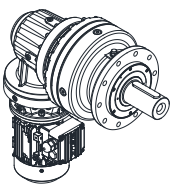
M1-B

PV1502K.01



M1-C

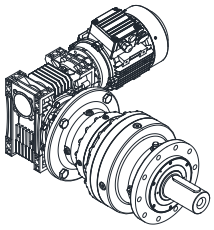
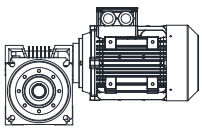
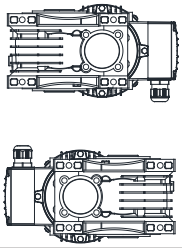
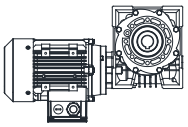
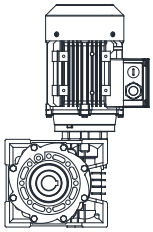
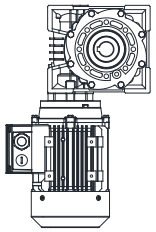
PV1502K.01



M1-D

The oil quantities in the table are given for the .01 - .1K - .1L output options. For oil quantities in other output options, please consult us.

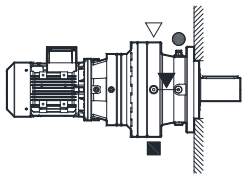
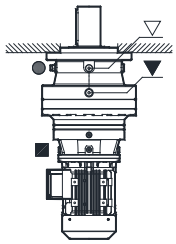
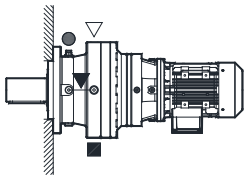
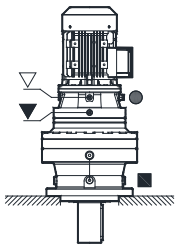
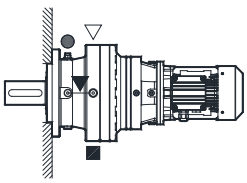
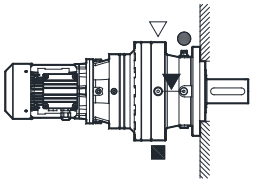
9.4- Oil Quantities [liter]

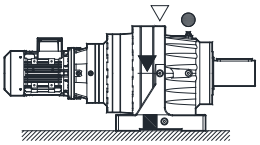
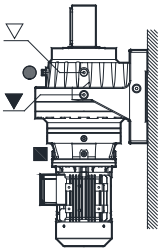
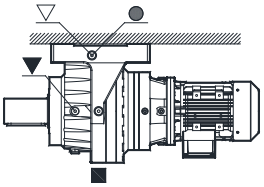
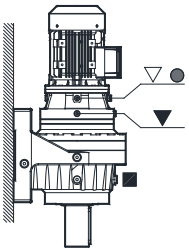
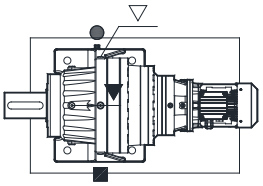
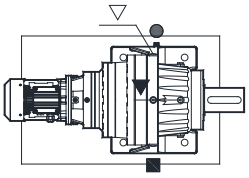
Worm Gearbox at Input Stage						
		Mounting position				
		M1	M5/M6	M3	M4	M2
						
Worm Gear-box at Input Stage	**Main gearbox unit**					
EV063 EN063 ET063	**PN11 / RN11 PN12 / RN12**	0,3	0,4	0,3	0,4	
EV080 EN080 ET080	**PN15 / RN15 PN16 / RN16**	0,5	0,8	0,7	0,8	
EV100 EN100 ET100	**PN19 / RN19**	1,7	2,0	1,2	2,1	1,8
EV125 EN125 ET125	**PN23 / RN23 PN24 / RN24**	3,3	3,8	2,5	3,6	

To planetary gear units added worm gearboxes have separate oil plug. Worm gearboxes have not oil plug for all positions. Therefore the oil level is understandable with quantity of filled oil . E63 and E80 type worm gearboxes are filled with synthetic oil. E100 and E125 type worm gearboxes are filled with mineral oil. Synthetic oil does not need to be changed for life time. Changing the oil of gearbox units filled with mineral oil is recommended after 10.000 hours working.

9.5- Oil Plugs

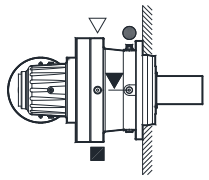
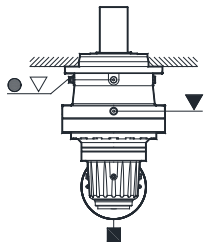
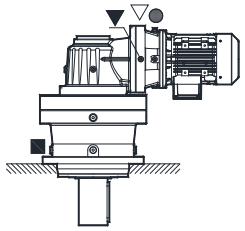
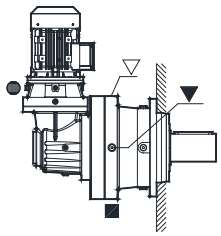
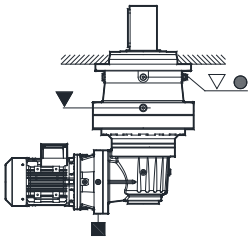
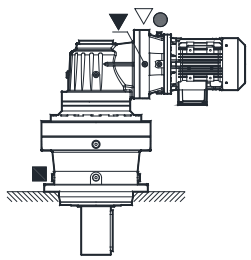
9.5.1- Oil Plugs for P-R Series L Type

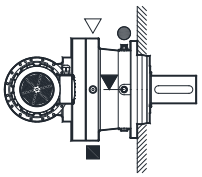
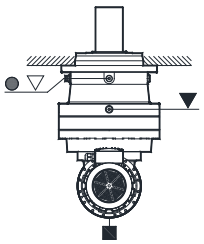
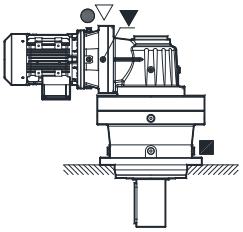
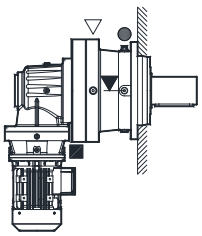
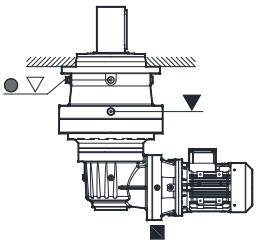
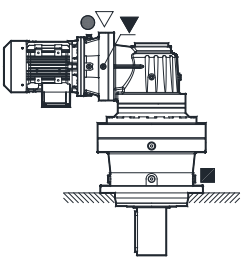
Mounting position	1-2-3-4 Stages
M1	
M2	
M3	
M4	
M5	
M6	

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

Symbols : ■ :Drain Plug ∇ :Oil Filling ▼ *:Oil Level* ● *:Breather*

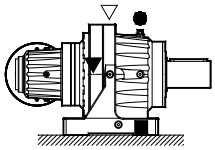
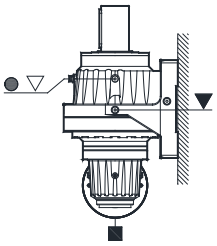
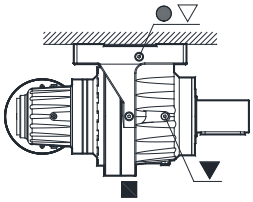
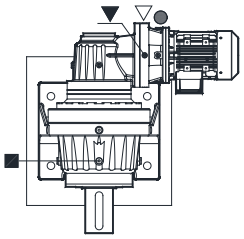
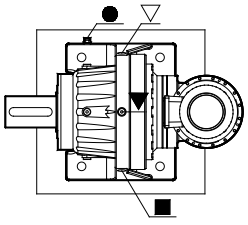
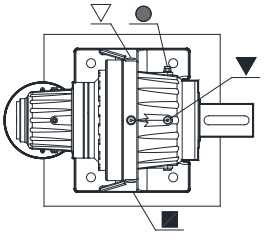
9.5.2- Oil Plugs for P Series K Type

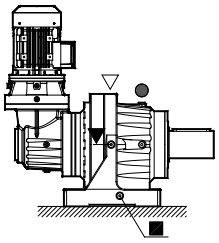
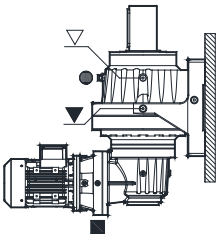
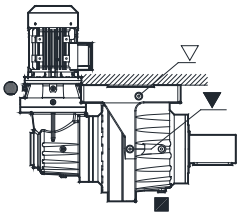
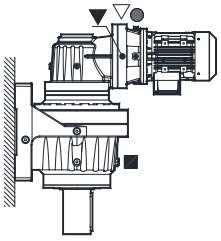
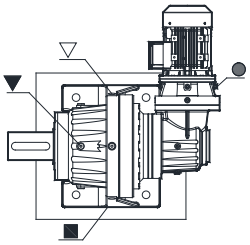
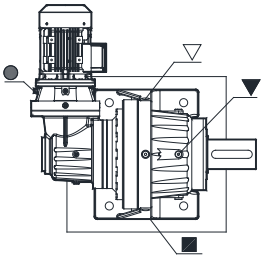
Mounting position	1-2-3-4 Stages
M1-A - M3-A M5-A - M6-A	
M2-A	
M4-A	
M1-B - M3-B M5-B - M6-B	
M2-B	
M4-B	

Mounting position	1-2-3-4 Stages
M1-C - M3-C M5-C - M6-C	
M2-C	
M4-C	
M1-D - M3-D M5-D - M6-D	
M2-D	
M4-D	

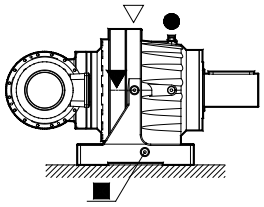
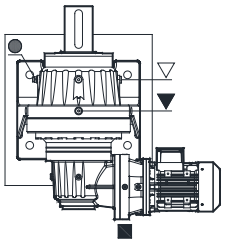
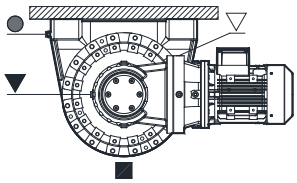
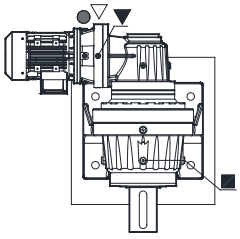
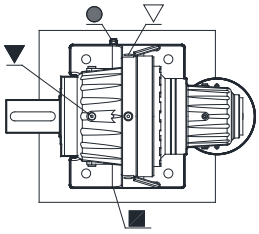
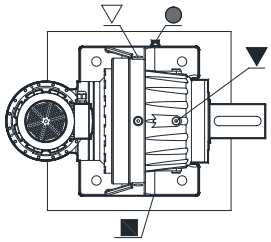
Symbols : ■ :Drain Plug ∇ :Oil Filling ▼ *:Oil Level* ● *:Breather*

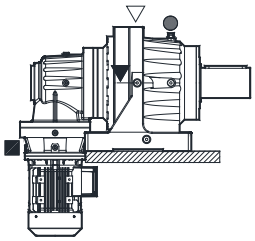
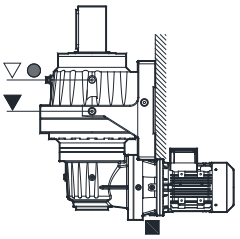
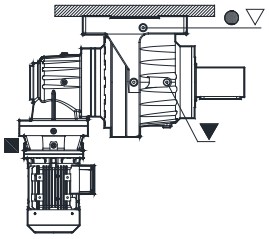
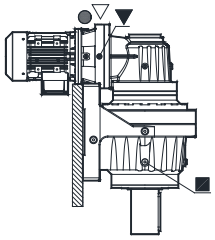
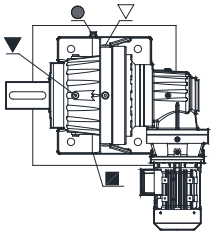
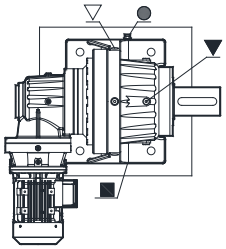
9.5.3- Oil Plugs for R Series K Type

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

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

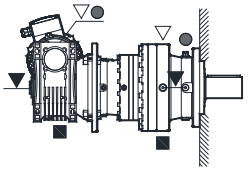
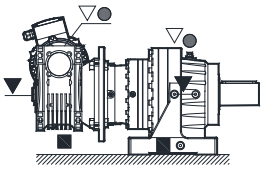
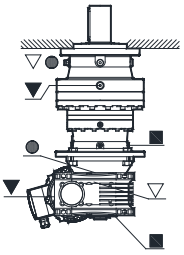
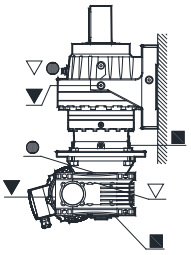
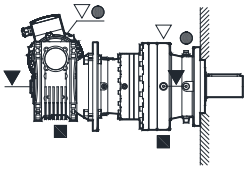
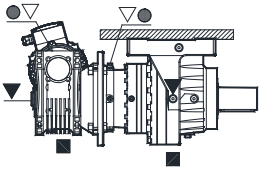
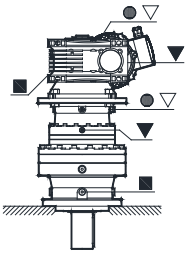
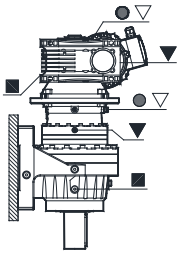
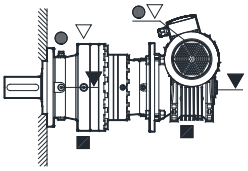
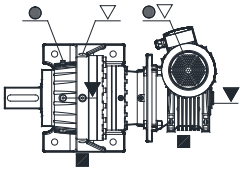
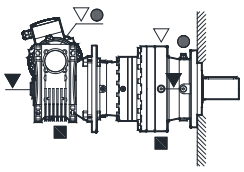
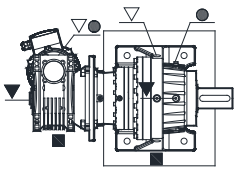
Symbols : ■ :Drain Plug ∇ :Oil Filling ▼ *:Oil Level* ● *:Breather*

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

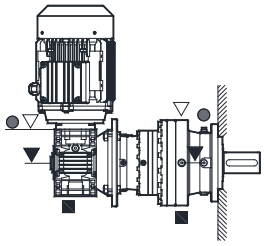
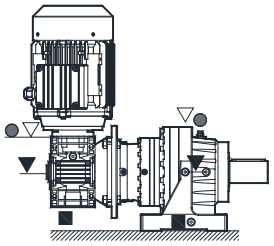
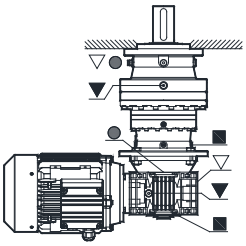
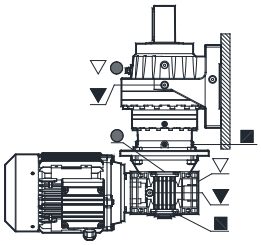
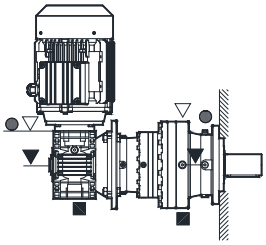
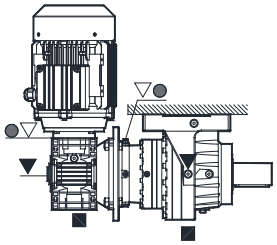
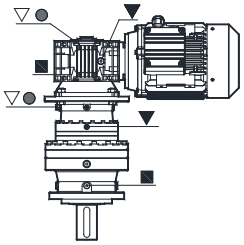
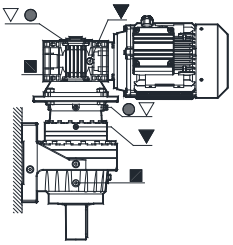
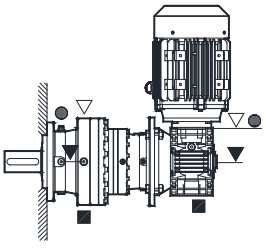
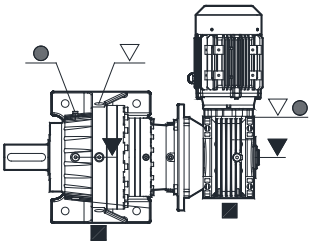
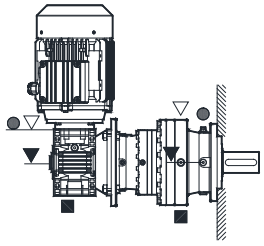
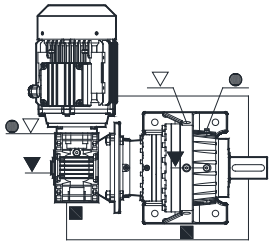
Mounting position	1-2-3-4 Stages
M1-D	
M2-D	
M3-D	
M4-D	
M5-D	
M6-D	

Symbols : ■ :Drain Plug ∇ :Oil Filling ▼ *:Oil Level* ● *:Breather*

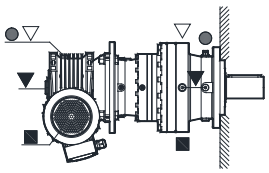
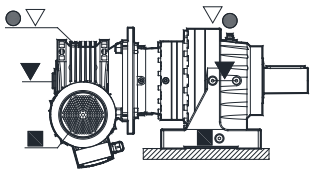
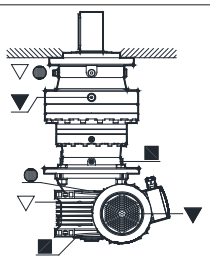
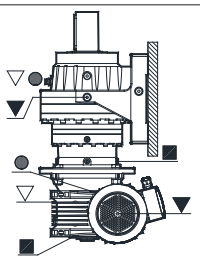
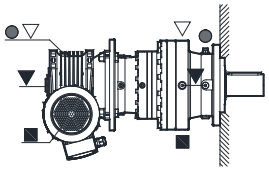
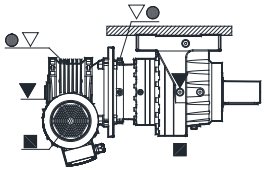
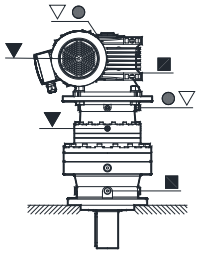
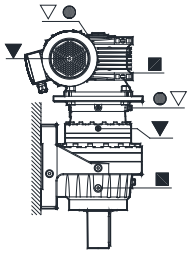
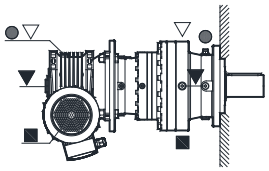
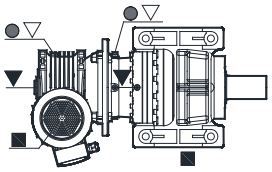
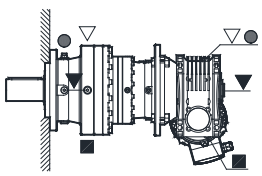
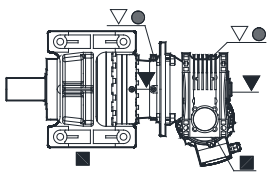
9.5.4- Oil Plugs for R Series Gearboxes Combined with E Series

Mounting position	P Type	R Type
M1-1		
M2-1		
M3-1		
M4-1		
M5-1		
M6-1		

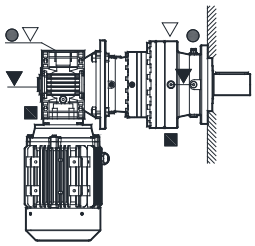
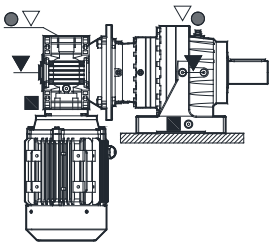
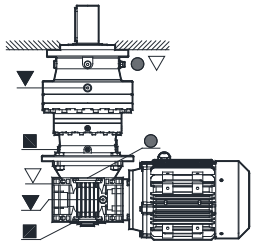
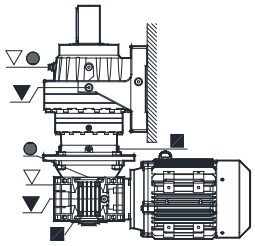
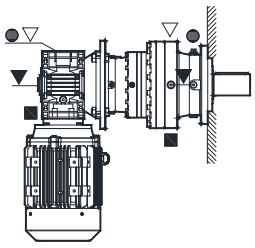
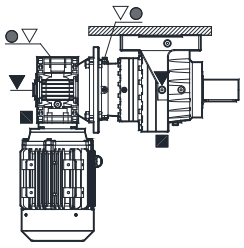
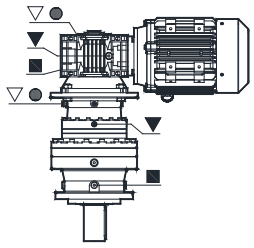
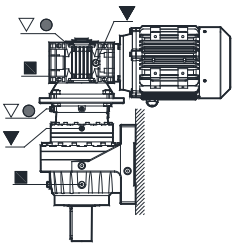
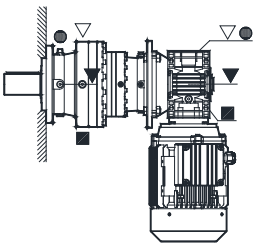
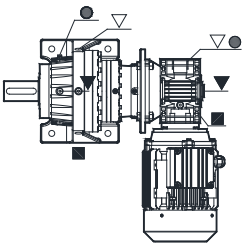
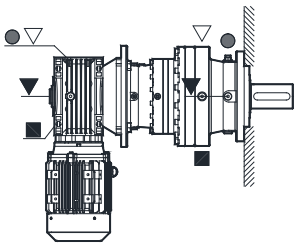
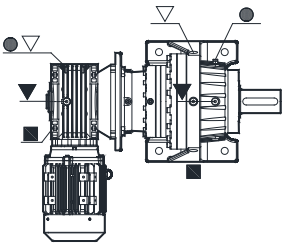
Symbols : ■ :Drain Plug ∇ :Oil Filling ▼ *:Oil Level* ● *:Breather*

Mounting position	P Type	R Type
M1-2		
M2-2		
M3-2		
M4-2		
M5-2		
M6-2		

Symbols : ■ :Drain Plug ∇ :Oil Filling ▼ *:Oil Level* ● *:Breather*

Mounting position	P Type	R Type
M1-3		
M2-3		
M3-3		
M4-3		
M5-3		
M6-3		

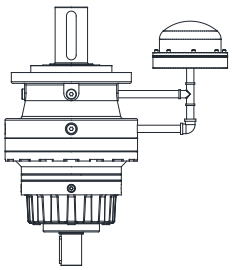
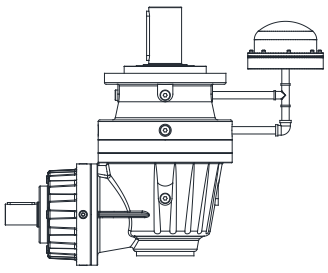
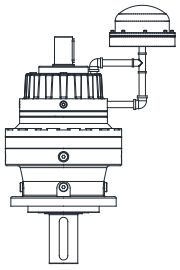
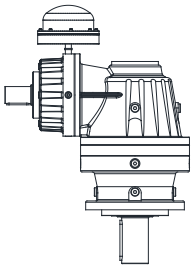
Symbols : ■ :Drain Plug ∇ :Oil Filling ▼ *:Oil Level* ● *:Breather*

Mounting position	P Type	R Type
M1-4		
M2-4		
M3-4		
M4-4		
M5-4		
M6-4		

Symbols : ■ :Drain Plug ∇ :Oil Filling ▼ *:Oil Level* ● *:Breather*

9.6- 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	Optional	Optional
M2		
M3	Optional	Optional
M4		
M5	Optional	Optional
M6	Optional	Optional

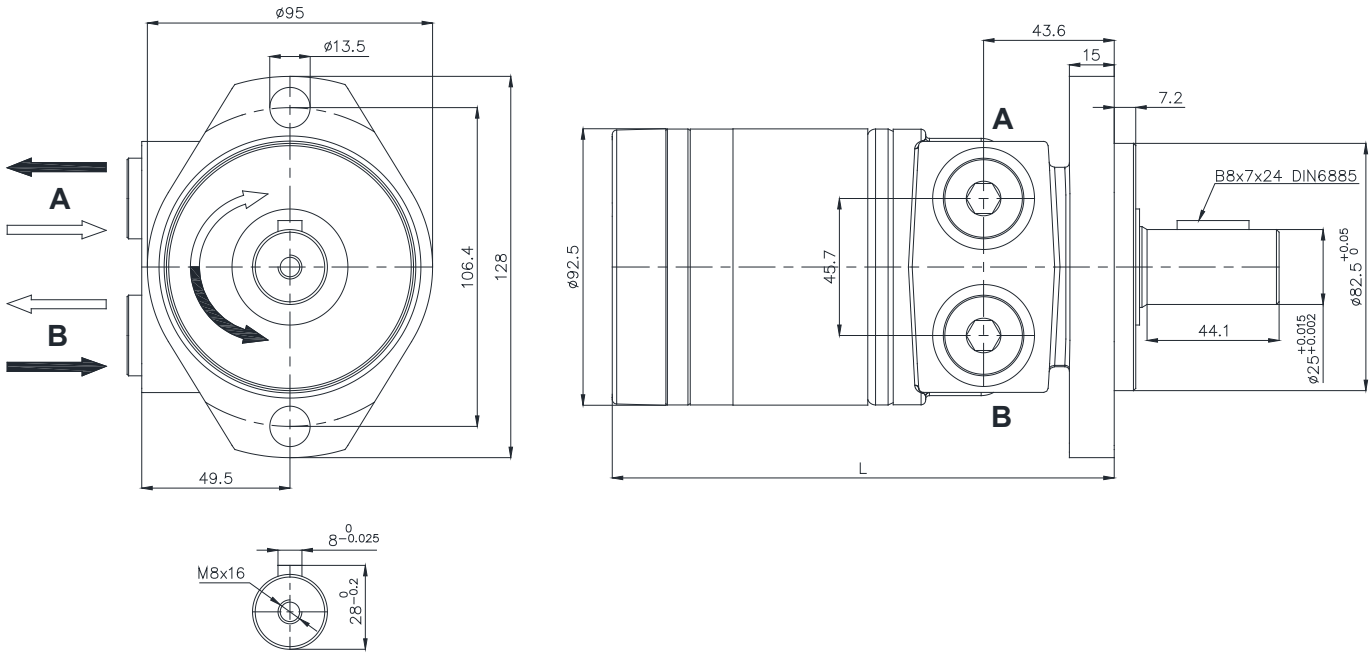
10- Hydraulic Motors

All motors must be charged with hydraulic fluid before being operated and during installation. You can find the technical information and picture below. Performance diagrams or other detailed informations please see the P / R series product catalogue or contact YILMAZ REDUKTOR.

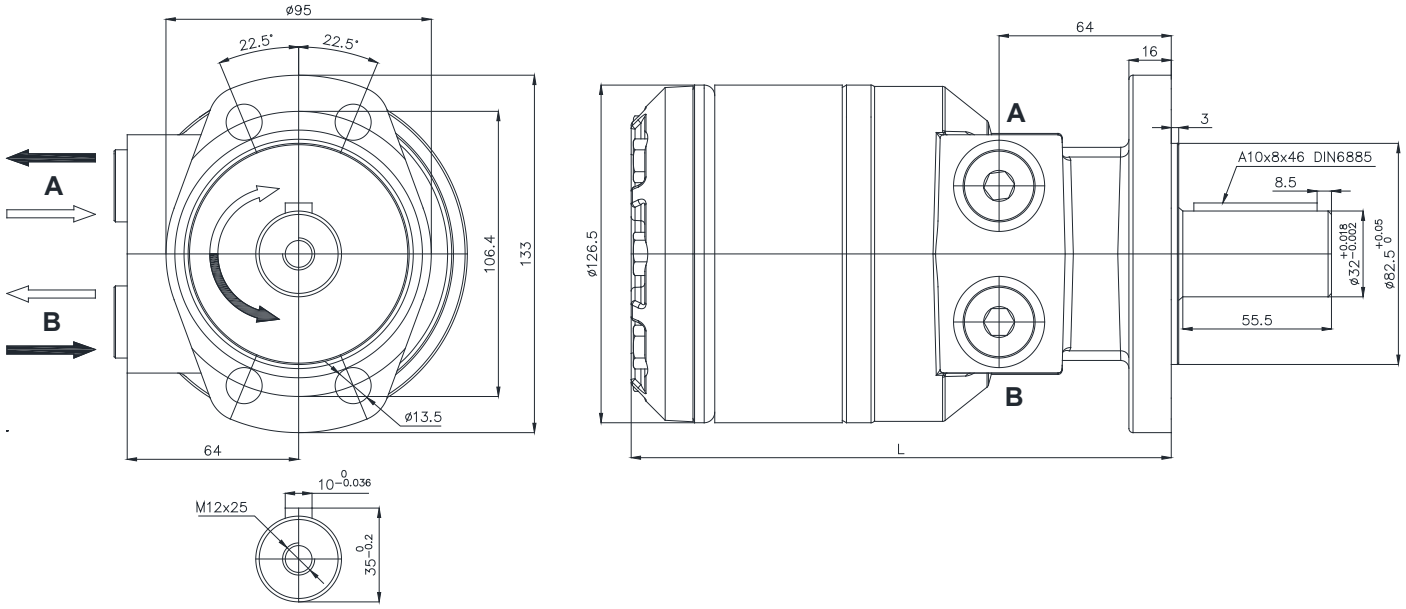
	Type	Geometric Displacement V [cm/rev]	Maximum Speed [rpm]	Max. Oil Flow Q [l/min]	Max.Pressure Difference [Bar]	Max Supply Pressure[bar]	Maximum Torque [Nm] (cont / int)	Maximum Power [kW]	Min. Starting Torque[Nm]
HE	**HE 36**	36	930 / 1160	35 / 42	140 / 190	200	55 / 70	8,5	44 / 52
	HE 45	41	810 / 990	35 / 42	140 / 190	200	70 / 100	10	44 / 64
	HE 50	50	725 / 935	35 / 45	140 / 175	200	90 / 115	11	72 / 92
	HE 65	66	705 / 940	45 / 60	140 / 175	200	125 / 160	15	100 / 128
	HE 80	82	560 / 750	45 / 60	140 / 175	200	160 / 200	15	128 / 160
	HE 100	98	470 / 630	45 / 60	140 / 175	200	190 / 240	15	152 / 192
	HE 130	130	350 / 470	45 / 60	140 / 175	200	255 / 320	15	204 / 256
	HE 165	163	280 / 375	45 / 60	140 / 175	200	310 / 395	15	248 / 316
	HE 195	196	235 / 315	45 / 60	140 / 175	200	390 / 480	15	312 / 384
	HE 230	228	265 / 330	60 / 75	120 / 150	200	380 / 480	15	304 / 384
	HE 260	261	230 / 290	60 / 75	110 / 140	200	400 / 525	15	320 / 420
	HE 295	293	200 / 255	60 / 75	100 / 130	200	410 / 520	13	328 / 416
	HE 330	326	185 / 235	60 / 75	100 / 120	200	430 / 530	13	344 / 424
	HE 365	370	150 / 200	60 / 75	95 / 110	200	467 / 558	11	373 / 446
	HE 390	392	152 / 190	60 / 75	85 / 100	200	435 / 540	10	348 / 432
HG	**HG 140**	140	530 / 710	75 / 100	200 / 280	300	400 / 545	33	320 / 436
	HG 170	169	440 / 575	75 / 100	200 / 280	300	485 / 670	33	388 / 536
	HG 195	195	380 / 510	75 / 100	200 / 280	300	560 / 770	33	448 / 616
	HG 240	237	320 / 420	75 / 100	200 / 280	300	685 / 945	32	548 / 756
	HG 280	280	270 / 350	75 / 100	200 / 280	300	800 / 1100	31	640 / 880
	HG 335	337	225 / 290	75 / 100	200 / 280	300	980 / 1350	30	784 / 1080
	HG 405	405	185 / 245	75 / 100	170 / 240	300	960 / 1350	27	768 / 1080
	HG 475	476	160 / 240	75 / 115	140 / 200	300	960 / 1400	28	768 / 1120
	HG 530	529	140 / 215	75 / 115	140 / 170	300	1050 / 1280	23	840 / 1024
	HG 625	624	120 / 185	75 / 115	120 / 160	300	1040 / 1360	20	832 / 1088
	HG 785	786	95 / 145	75 / 115	100 / 140	300	1150 / 1490	17	920 / 1192
	HG 960	958	78 / 119	75 / 115	70 / 100	300	925 / 1390	12	740 / 1112

Intermittent operation rating applies to %10 of every minute.

10.1- HE Series flange and Shaft dimensions



10.2- HG Series flange and Shaft dimensions



11- 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 REDÜKTÖR. 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 condansator and running condansator 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 REDÜKTÖR 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.

ID	Problem	Observation	Remedy
006	Gearbox Does Not Work in Low Speeds/ frequencies.	You are using frequency inverter.	For very low speeds the frequency inverters frequency is lowering down. For very low frequencies the inverter parameter and motor parameter must be optimise. 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 Manuel for using the correct oil. Working in higher ambient temperatures is an other solution if possible. If still same problem you need higher motor power.
008	Gearbox is Heating Up too Much	You are using Worm Gear Box and ambient tenp 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. If higher than +120 Celsius and using ATEX conforming gear box immediately stop the system and contact YILMAZ REDUKTOR. Go to ID 100. If not ATEX confirming 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 Up too Much	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. If higher than +120 Celsius and using ATEX conforming gear box immediately stop the system and contact YILMAZ REDUKTOR. 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 quantitiy/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 Up too Much	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 REDÜKTÖR
011	Gearbox is noisy	Nois is regular continious	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	Nois is random	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you hear still the noise the oil may has 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



ID	Problem	Observation	Remedy
013	Gearbox is noisy	Regular nocking 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 disk 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 optimised 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 go to 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
024	Motor is heating up	Ambient is dusty	Check the motor Fan Hub and rips. 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

ID	Problem	Observation	Remedy
025	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
026	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
027	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 radial load and check if this fit to the maximum allowed radial load. Go to ID 100
028	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.
029	Gearbox is starting too late	You are using braked motor	A 24V shock transformer is recommended for fast opening of big brakes (≥ 200 Nm) and shock rectifier is recommended for smaller brakes (< 200 Nm). 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 declarations and YILMAZ REDUKTOR will take no responsibility.

12- Disposal

If your product is no longer of use and you wish to dispose of it, refer to the instructions here. If you have any questions regarding ecological disposal methods, please consult our service points given on the backside of this Manuel.

12.1- Disposal of Oil

Lubricants (oil and greases) are hazardous substances, which can contaminate soil and water. Collect drained lubricant into suitable receptacles and dispose of it according to the valid national guidelines.

12.2- Disposal of Sealings

Remove the sealing rings from the gear reducer, and clean them of oil and grease residues. Dispose of the sealings as composite material (metal/plastic)

12.3- Disposal of Metal

Divide up the remainder of the gear reducer into iron, aluminium, non-ferrous heavy metal if possible Dispose of it according to the valid national guidelines.

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. Special Gearbox parts made according customer request are not covered by this warranty.

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 REDÜKTÖR San. ve Tic. A.S.
ATATÜRK Mah. Lozan Cad. No:17 P.K.:34522 Esenyurt-İstanbul-TÜRKİYE
Phone: +90 (0) 212 886 90 00 (8 Lines)

Warranty Decleration
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-İstanbul- TURKİYE
Telefon : +90 (0) 212 886 90 00 (8 Lines)

Stamp and Signature

Supplier / End User:

With signing this part and sending this back to our company your waranty 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:

Supplier/ End User Stamp and Signature

Notes

Domestic Service

Tel: +90 212 886 90 00
Int: 1223, 1228, 1287
Whatsapp: +90 554 713 71 02
E-Mail: servis@yr.com.tr

Spare Parts

Tel: +90 212 886 90 00
Int: 1224, 1277
Whatsapp: +90 506 774 44 35
E-Mail: yedekparca@yr.com.tr

International Services

If you call the above service point, you will be directed to our nearest service.

Yılmaz Redüktör Sanayi ve Ticaret A.Ş.

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