



REDÜKTÖR VARYATÖR SAN. ve TİC. A.Ş. / GEARBOX & VARIATOR CORPORATION



IPR Series **OPERATING GUIDE**

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1. IMPORTANT NOTES

1.1 GENERAL

This operating guide book covers the important rules concerning the hauling, installation and operation of gearbox.

These rules should be applied to guarantee an optimal performance of the gearbox and its longevity in time. Carefully read the information and apply it rigorously.

This operating manual should be kept along with other relevant documentation. This manual have to be stored by personnel appointed to that task. This document should always be available and kept in good conditions. In case of damage or lost of this manual, request a new version from I-MAK reseller or directly at the manufacturer.

Note that the manual for electrical motor coupled to the gearbox must be provided by the motor manufacturer.

The manufacturer reserve the only and exclusive right to add modification to this user manual, all modification made without confirmation of I-MAK will not be running and the manufacturer will not be held as responsible In case of damage or accidents.

Our company must be contacted with about the problems and applications concerning the issues that are not stated in this operating guide, and written information should be asked about solutions. Our company will not be held responsible on the contrary. Please contact with the following addresses and phone numbers in such situations.

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 Before the beginning of all operations, please check that the gearbox is adapted for your application and that all technical data are matching with the offer confirmed by the manufacturer.


 The gearbox that you have purchased have been designed to operate solely and they should never be coupled with other gearboxes or drive solutions without the acceptance of the manufacturer.


 The gearbox that you have purchased have been manufactured according to the provisions numbered 98/37/AT (98/37/EEC) and in this scope, the manufacturer is responsible only if all the conditions stated in this manual are strictly applied.


 The machines, that are to be coupled with the gearbox that you have purchased, must fulfil the basic requirements of the provisions numbered 98/37/ AT (98/37/EEC).


1.2 EXPLANATIONS


The description of the symbols in this operating guide is as follows:

 This symbol calls attention to security measures that should be taken in order to prevent danger that may come to the unit you purchased.

 This symbol calls attention to the security measures that would prevent personal injuries.

 This symbol expresses possible dangers that may cause death and injuries.

 This symbol expresses the rules that must be applied in any case.

 This symbol represents to could harm the environment refers to rules that must be followed.



2. SECURITY NOTES

The gearboxes provided by I-MAK are designed and produced following strict and specific norms. Never attend to make modification to any parts of the gearbox without the authorization of the manufacturer. Any modification made on the gearbox will automatically result to the end of the guarantee period and a transmission of responsibilities from the manufacturer to your organization.



This product should only be used and operated under the conditions stated in the catalogue and operating guide.



All the person operating this gearbox should consult this Manual. The responsible person should also assure that they follow all the listed rules to ensure.

-
- The prevention of risks and danger that might cause injuries on the user and third parties.
- The safety and performance of the product.
- The prevention of pollution and environmental risks.
- Safety of the working environment.



The maintenance and the operation of this product can be made only by authorized and specialized personnel who has been trained to the requirements of the product.



The entire work shall be carried out carefully and with safety.



The operating guide that is given together with the gearbox should be protected with labels and warnings placed on the product from materials such as paint, dust, moisture etc. and should be renewed when necessary.



All maintenance and installation work to be carried out on the product (installation, hauling, mounting, maintenance etc.) should only be conducted when the product is completely stopped and the power is down. All safety precautions should be taken in order to prevent the accidental operation of the product. Signs and warnings that would prevent the product to operate, should be placed on the visible parts of the mechanism, which is coupled with the product, and on the start button in order to indicate that these processes continue on the product.



All rules concerning industrial safety and pollution control should be taken into consideration during usage, installation, operation, maintenance and protection.



The plant or application manager should assure that all the rotating part are covered to prevent all accidental contacts incurring a risk of crushing, cutting or entanglement. (All the basic requirements of the provision numbered 98/37/ AT (98/37/EEC) regarding safety precautions should be applied).



The gearbox should be immediately stopped in the case the unit produce excessive noise or face oil licking. Contact the manufacturer or the authorized reseller in your area



Remember that the oils used can be harmful to health and environment. All measure to prevent the contact of this oil with skin and eyes should be applied.



Old and dirty oil, drained from the product during the oil renewal, should be put into an appropriate container and destroyed in a proper process following your local rules regarding environmental protection. The extremely dirty and greasy cleaning elements should also be kept in appropriate containers and destroyed without harming the environment.



In the case the gearbox is used In a food processing environment, please inform the manufacturer to adapt the device to your activities. Direct contact with the food processed should also be avoided. The oils and lubricants should be adapted to your norms and hygiene requirements.

3. HAULING AND STORAGE

3.1. HAULING



The personnel operating the transport of the package should take all the necessary measures to protect their own safety and that of other people involved.

At the reception of the gearbox, make sure that the delivery corresponds to the gearbox you order and that the unit is not damaged. In case of problem report directly to the manufacturer or to the authorized reseller in your region.

During the lifting all the accessories such as screw clamps, eyebots, snap hooks, ropes and hooks should be certified and adequate for the load. Before handling please check the weight specified on the name plate or the catalogue. During transportation the product should be fixed upon the transportation vehicle to prevent all moves and risks of overturn.

3.2 STORAGE



The gearbox should be placed on a stable base and in a position avoiding all risk of it moving or falling out.



If the gearbox should be stored for a period superior to 4 months. Special precaution should be taken, it is necessary to keep the gearbox in a non-humid environment in which ambient temperature is not facing extreme variations. The gearbox should also be protected from dust and vibration. Protective oils that prevent the pivot ends from oxidation should be changed periodically.



Never change the covering of the gearbox. The mechanical (scratches), chemical (acid, alkaline melting) or thermal (spark, solder light, heat) damages that may possibly form on the covering may lead to rusting and outer protection deficiency.

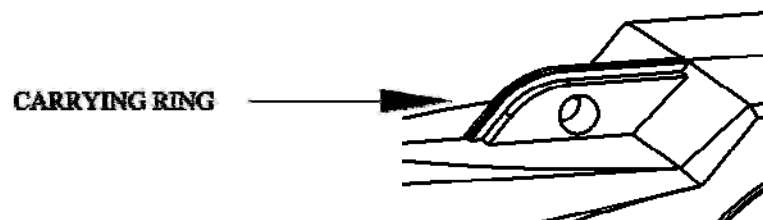
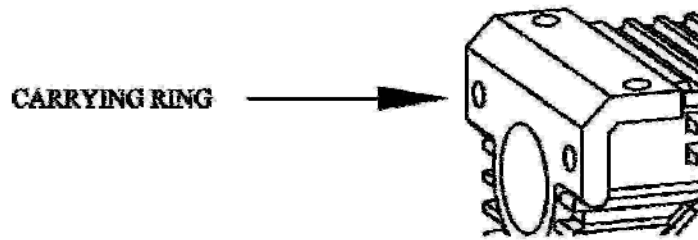
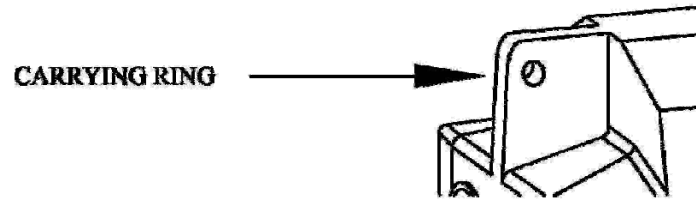
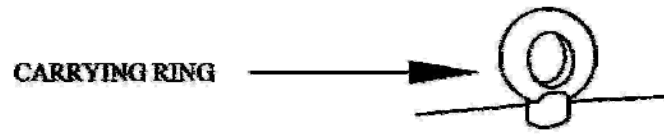


If the gearbox is stored outside all precaution should be taken to assure that humidity or external materials don't affect the gearbox.



Periodically proceed to one or two turns of the output and input shaft, this action will avoid the damage of the bearing and the seals.





4. MOUNTING AND DISMOUNTING



The mounting process should be conducted by authorized personnel. The responsible personnel should take all the measure to avoid risks and dangers for the surrounding personnel.



The gearboxes should only be assembled and operated in assembling positions indicated in this operating manual. Manufacturer should be consulted before operating assembling positions not listed in this manual.

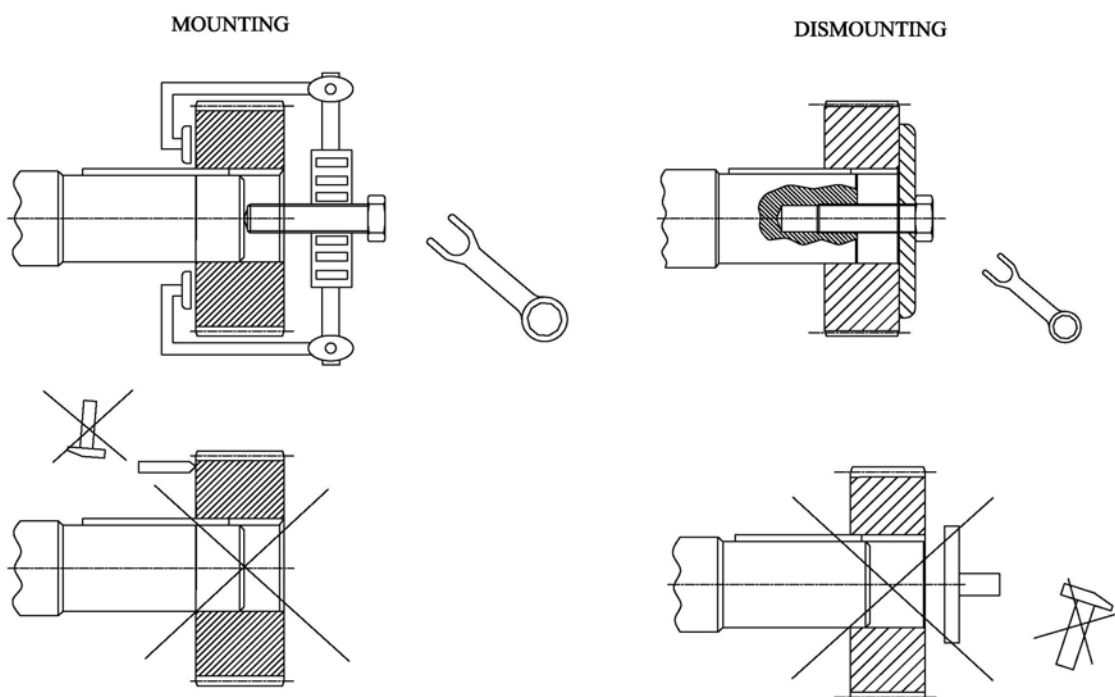


Before the mounting make sure to prepare a clean and clear area. All the requirements of the legislation number 98/37/ AT concerning this subject should be applied.



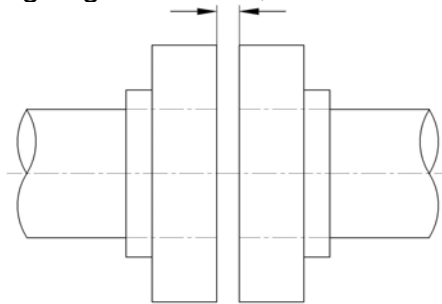
After mounting your gearbox on your application, operate a sound measurement to check the conformity of the sound level with the local legal legislations. The adequate volume depend on the speed, the power rate and the power proportion of the used unit.

- I. Before beginning the process of the assembling or disassembling of your gearbox read carefully all the sections of this manual.
- II. Carefully take care of removing all packaging and protective products on the gearbox. Make sure that you use suitable solvents. Avoid to apply any solvents on the shaft seal ring
- III. Before starting the mounting of the gearbox, make sure that the position of the vent plug is adapted to the assembling position. In case of any problems contact the manufacturer or the authorized seller in your region. *(Please check our catalogue to consult the different mounting position of the vent plug.*
- IV. In the case the gearbox is to be mount in outdoor environment, make sure that all the mounting and coupling material are protected against corrosions and external aggressions. Ensure that the gearbox is protect from dust, water and chemicals.
- V. Avoid the usage of hammers and any tools that might damage the gearboxes shafts, bearings or couplings. Follow the instruction and recommendations shown as below.

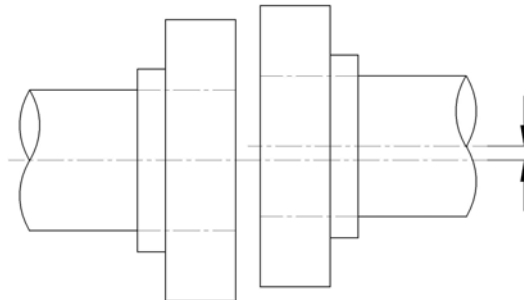


- VI. Avoid the usage of hammers and any tools that might damage the gearboxes shafts, bearings or couplings. Follow the instruction and recommendations shown as below.
- VII. The chassis on which you will mount your gearbox should be straight, clean and rigid.

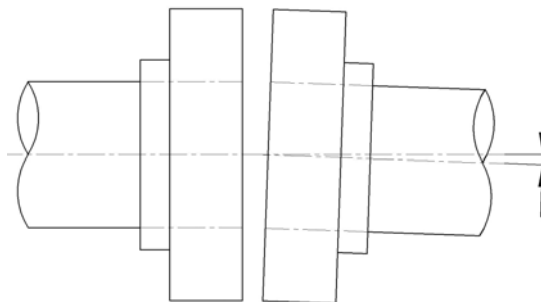
VIII. If a coupling is going to be used;



Ensure that there is enough space between the two couplings,



Make sure that the output shaft and the cylindrical shaft of the application are on the same axis,



Always choose elastic couplings to reduce the load and rigidity.

5. OPERATION

- Fulfilling the requirement as listed in the operating guide, you can demonstrate the operation conditions of your gearbox and start operation of the product.
- For motor-driven type products check if grounding has been applied.
- For motor-driven type products be sure that the electrical connections are done correctly and firmly according to the electrical diagram on the Clemens box.
- Gearboxes may rotate in both ways except for the locked types. Before starting your machine ensure that the gearbox is mounted in the right direction. In the case your gearbox is equipped with a backstop device, you should avoid in any case the motors to turn in the opposite direction of your gearbox
- In the case the temperature of the working environment is to exceed intervals in between +5° C and + 60° C, Contact the manufacturer to receive special assistance and adapted solution for your environment.
- After starting your gearbox make sure that there is no unusual noise or vibration.
- Obtain an information document on cooling interval period of your products from the manufacturer and take precautions according to the listed intervals.
- In the case you installed optional accessories or external systems, make sure that they are in accordance with the gearbox type and that you respected all the security and conformity norms.

6. CONTROL AND MAINTENANCE

All the maintenance and replacement operations must be carried out by maintenance technicians or authorized sellers. In order to maintain the efficiency and the safety of the gearbox we recommend you to apply all the maintenance advices listed in this manual.



Before starting all operations of maintenance the operator must switch off power to the gearbox and ensure that the machine is out of service. All precaution should also be taken against accidental switch on.

GEARBOXES:

- Check the oil levels. Use the oils and lubricants recommended by the manufacturer.
- Change the oil after 500 hours of initial operation and periodically every 6000 hours of operating the motor.
- During these operations take all measures to avoid contact with oils and greases, respect all the safety precautions listed in this manual.
- Check if the ventilation plug is working or obstructed. If the ventilation plug does not work there is a risk of high pressuring the gearbox and create gas leakage. Periodically remove all dust and residues from the gearbox and the motor casting.
- Check that the gearbox is not generating any noise or vibration. Excessive noise or vibration can indicate the failure of a bearing or damage of the gear train.
- Check the motor connexions. If you are using a brake motor, control the friction surface and adjust the gap if necessary.
- Check if the ventilation stopper is active or not. If the air evacuation hole does not work, the accumulated air in the motor trunk causes pressure and gas leakage from the mats.
- Control the temperature level, make sure that it not rise above normal. If the temperature rise above the tolerated level, immediately stop it and identify the cause of the excess.
- Change the oil after 500 hours of initial operation and periodically every 6000 hours of operating the motor.
- Regularly check all the couplings, control the absence of deformation and corrosion.
- Contact the manufacturer or an authorized seller before operating any special maintenance operations.












7. FREQUENTLY ASKED QUESTIONS

PROBLEM	POSSIBLE CAUSES	SOLUTION
Hardly regular, noises are heard	<ol style="list-style-type: none"> 1. The bearings might be damaged if the noise is like a grinding sound 2. If the like a hitting noise there a change of breakage in the gearing 3. Excesive load 	<ol style="list-style-type: none"> 1) Check the oil (See part 6) 2) Contact authorized service 3)Control the adequation of the load with the current capacity of your geared motor.
Irregular noises are heard	There could be foreign substance in the oil	<ol style="list-style-type: none"> 1.Check the oil 2.Stop operating and contact authorized service
<u>Oil is leaking</u> from the motor flange, the oil containers, motors and oil stopper	<ol style="list-style-type: none"> 1.The stopper container or gasket could be damaged 2.The trunk of the motor could be cracked 	Contact authorized service
Oil is leaking from the ventilation opening	<ol style="list-style-type: none"> 1.Excess oil might be filled 2.The ventilation opening is not in an appropriate position 	<ol style="list-style-type: none"> 1.Check oil levels (See part 8) 2.Check mounting position (See part 8)
The motor is working but the exit pivot or entrance pivot is not rotating	The wedge of the gearing could be scraped of the gears could be completely broken and connection could stop	Contact authorized service



Contact us for further information and inquiries
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Lubricant	ISO Viscosity Class	DIN 51517-3	Usage Temperature C°	Firm						
										
Mineral Oil	ISO VG 320	CLP	0.....+100	Mobilgear XMP 320	Degol BG 320	Energol GR-XP320	Omala F320	Alpha SP 320	GEM 1 320 N	Spartan EP 320
	ISO VG 220	CLP	-5.....+100	Mobilgear XMP 220	Degol BG 220	Energol GR-XP220	Omala F220	Alpha SP 220	GEM 1 220 N	Spartan EP 220
	ISO VG 150	CLP	-5.....+100	Mobilgear XMP 150	Degol BG 150	Energol GR-XP150	Omala 150	Alpha SP 150	GEM 1 150 N	Spartan EP 150
	ISO VG 100	CLP	-5.....+100	-	Degol BG 100	Energol GR-XP100	Omala 100	Alpha SP 100	GEM 1 100 N	Spartan EP 100
Synthetic Oil	ISO VG 320	CLP PG	-25.....+140	Gylgoyle 320	Degol GS 320	Enersyn SG-XP320	Tivela S 320	Alphasyn PG 320	Klübersynth GH 6-320	Glycolube 320
	ISO VG 220	CLP PG	-25.....+140	-	Degol GS 220	Enersyn SG-XP220	Tivela S 220	Alphasyn PG 220	Klübersynth GH 6-220	-
	ISO VG 150	CLP PG	-30.....+140	-	Degol GS 150	Enersyn SG-XP150	Tivela S 150	Alphasyn PG 150	Klübersynth GH 6-150	-
	ISO VG 100	CLP PG	-30.....+140	-	-	-	-	-	Klübersynth GH 6-100	-

Yağlama

Doğru bir yağlama dişli kutularının verimli çalışması için gereklidir. Bundan dolayı aşağıdaki kriterler çalışma esnasında kontrol edilmeli.

- Bütün yağ tapalarının önerilen çalışma pozisyonuna göre uygun monte edilip edilmediği kontrol edilmelidir.
 - Yatay montaj edilmiş redüktörleri ; düz veya ayna mahrutili oluşuna bakılmaksızın yarısına kadar yağ ile doldurunuz. Görsel olarak kontrol için merkez hattı üzerindeki tapa gevşetilir ve yağ seviyesi kontrol edilir.
 - Doksan derece ayna mahruti ünitesi montajlı tiplerde yağ serbestçe dolaşmalıdır. Doldurma işlemi montaj pozisyonuna göre yerde her iki yönden ama aynı anda yapılmamalıdır. Bu şekilde yağın bölümler arasında yer değişmesine olanak vericek ve uygun miktarda yağ almasını sağlayacak şekilde olmalıdır.
 - Dik olarak montaj edilmesi gereken modellere daha özel bir ihtimam gösterilmelidir bu durumda ünite tamamıyla doldurulmalıdır. Bu gibi durumlarda yağ genişleme kabı kullanımı tavsiye edilir ki ayrı olarak talep edilmesi halinde temin edilir. Bu tank dişli kutusu ünitesinin en uç noktasına monte edilerek genişleyen yağ miktarını rezerve etmesi sağlanır. Dişli kutusu soğumaya başladığında bu yağ tekrar redüktör içine giderek yağ kaybını önleyerek zaman içinde olası tahribatları engeller.
 - Devamlı çalışma şartları altında ve fazla yağ ile çalışan dişli kutularında daha düşük viskoziteli yağlar kullanılmalıdır.
- Dişli kutularının ilk çalışma zamanlarında temas yüzeylerine bağlı olarak metal parçalarına rastlanabilir. Hiç kuşkusuz bu metal parçaları dişli kutusu içinde hem dişli grupları hem de rulmanlar için bazı olumsuzluklar meydana getirebilirler. Bunu önlemek için redüktör yağını ilk 100 saat sonunda değiştirin. Manyatik tapaları düzenli olarak temizleyin tavsiye edilen yağ listesi devam eden sayfalarda bulabilirsiniz.

Lubrication

Correct lubrication is required to run drives efficiently. Therefore, check the following conditions during installation:

- Make sure that all plugs are correctly mounted with respect to the installation position specified in the order and according to the MOUNTING POSITIONS
 - Fill horizontally mounted units up to the central line regardless of a linear or angular configuration. To visually check the oil level, unscrew the plug located just above the center line.
 - For right angle units, the bevel gear is connected so that the oil is free to circulate. In any case, carry out the filling operation on both ends but not simultaneously, and while the unit is on the ground, based on the correct mounting position. This will speed up the operation and ensure that the correct quantity of oil is introduced regardless of how long it would take for the oil to go from one chamber to the other.
 - Particular attention should be paid to vertically mounted units which must be completely filled by means of elbows and extensions supplied with the unit. For these positions it is recommended to use an expansion tank, which can be supplied separately on request. This tank must be positioned above the highest point of the drive and is designed to collect any oil expansions or to ensure that the units mounted in hard to reach places can be topped up.
 - Units running under continuous duty conditions may overheat due to the large quantity of oil they contain. In these cases, use oil with a lower viscosity.
- During the first hours of operation of the reduction gears, due to the contact between surfaces that have not been run in, you will find metallic particles in the oil. Undoubtedly the separticles have a negative effect on the life of gears and bearings. To reduce the number of metallic particles in the oil we recommend:
- changing the oil after the first 100 hours of operation;
 - cleaning the magnetic plugs regularly; The recommended lubricants are listed below;

Schmierung

Nur eine korrekte Schmierung gewährleistet den problemlosen Betrieb des Getriebes. Es wird deshalb empfohlen, bei der Installation folgende Bedingungen zu überprüfen:

- Kontrollieren, ob je nach bestellter Montageposition die Einfüllstutzen korrekt montiert sind, vgl. dazu die Angaben im Abschnitt EINBAULAGE.
- Ist das Getriebe waagrecht montiert, muß es bis zur Mitte aufgefüllt werden; Sichtkontrolle des Ölstandes vornehmen, indem der Öleinfüllstopfen abgeschraubt wird.
- Bei Winkelgetrieben ist der rechtwinklige Teil so angebaut, daß das Öl ungehindert zirkulieren kann; es empfiehlt sich jedoch, das Öl am Boden einzufüllen, wobei es auf beiden Seiten geöffnet, aber nicht gleichzeitig eingefüllt wird; der Vorgang wird dadurch beschleunigt und man kann gleichzeitig sicher sein, die erforderliche Ölmenge einzufüllen, da das Öl Zeit braucht, um von einer Kammer in die andere zu fließen.
- Besondere Sorgfalt ist bei Getrieben erforderlich, die senkrecht montiert werden; sie müssen mit Hilfe der beigelegten Kniestücke und Verlängerungen vollständig aufgefüllt werden. Für diese Einbauposition wird die Verwendung eines Ausgleichsbehälter empfohlen, der auf Anfrageseparat geliefert wird. Das Gefäß muß oberhalb des höchsten Getriebepunktes positioniert werden und soll überschüssige Ölmenge aufnehmen bzw. bei Getrieben in unzugänglichen Positionen ein sicheres Einfüllen gewährleisten.
- Außerdem kommt es bei Getrieben, die im Dauerbetrieb arbeiten, aufgrund der darin enthaltenen großen Ölmenge leicht zu Überhitzung; in diesem Fall wird die Verwendung von Öltypen mit niedriger Viskosität empfohlen. Während der ersten Betriebsstunden der Planetengetriebe gelangen durch den Kontakt der nicht eingelaufenen Oberflächen Metallpartikel ins Öl. Das Vorhandensein dieser Metallpartikel wird sich deutlich zum Nachteil der Lebensdauer von Zahnrädern und Lagern aus. Zur Reduzierung der Metallpartikel im Öl wie folgt vorgehen:
- Nach den ersten 100 Betriebsstunden einen Ölwechsel durchführen; machen; Kühlsystem filtern.
- Die empfohlenen Schmiermittel können der Tabelle unten entnommen werden.

Yağ Değişimi

Oil Changes

Schmierung

- İlk yağ değişimi redüktör işletmeye alındığı zamandan itibaren 100 saatir.
- Daha sonraki değişimler ise 2000 saat veya yılda bir kezdir , hangisi önce gelirse.
- Değişim esnasında yağ kalıntılarından kurtulmak için sıcak olmasında fayda vardır.
- Bütün tapalar temizlenmelidir.
- Yeni yağı koymadan önce yağ üreticisinin tavsiye edeceği sıvı bir deterjanla dişli kutusu temizlenmelidir.
- Redüktör çalışmadığı durumlarda belli periodlar içinde yağ kaçakları ve seviyesi kontrol edilmelidir. Gerekirse aynı tip yağ ile bütünlenmelidir.

- The first oil change should be done after 100 hours of duty
- Subsequent oil changes should take place after 2000 hours or at least once a year.
- To avoid sludge deposits, change the oil while the drive is still hot.
- Clean all plugs.
- Before adding the new oil, the unit should be flushed with a liquid detergent recommended by the lubricant supplier.
- Periodically check for oil leaks and the oil level while the unit is idling. If needed, top up using the same type of oil,

- Der erste Ölwechsel sollte nach 100 Betriebsstunden vorgenommen werden.
- Weitere Ölwechsel sollten nach 2000 Betriebsstunden bzw. mindestens einmaljährig erfolgen.
- Das Öl bitte bei noch warmen Getriebeablassen. Auf diese Weise werden Ablagerungen vermieden.
- Ölstopfen reinigen. • Vor dem Auffüllen mit neuem Öl, das Getriebe innen mit einem vom Schmierstoffhersteller empfohlenen Reinigungsmittel auswaschen.
- Getriebe regelmäßig auf Dichtigkeit prüfen sowie sicherstellen, daß bei Stillstand das Öl bis zum vorgesehenen Ölstand reicht. Sofern erforderlich, ist Öl nachzufüllen; der Öltyp muß mit dem im Getriebe bereits enthaltenen Öl unbedingt übereinstimmen.

Genel maksat yağları

General purpose lubricants

Schmiermittel für allgemeinen Gebrauch

Ortam sıcaklığı Ambient Temp. Umgebungs temp	Mineral yağ			Poly-Alpha-Olefin sentetik yağlar (PAO)			Polyglycol sentetik yağlar (PG)		
	Mineral oils			Poly-Alpha-Olefin synthetic oils (PAO)			Polyglycol synthetic oils (PG)		
	Mineralöle			Synthetische Poly-Alpha-Olefin-Öle (PAO)			Synthetische Polyglykolöle (PG)		
	-10°C +30°C	+10°C +45°C	+30°C +60°C		-20°C +60°C		-20°C +60°C		
Üretici Manufacturer Hersteller	ISO VG 150	ISO VG 220	ISO VG 320	ISO VG 150	ISO VG 220	ISO VG 320	ISO VG 150	ISO VG 220	ISO VG 320
AGIP	Blasia 150	Blasia 220	Blasia 320	-	Blasia SX 220	Blasia SX 320	Blasia S 150	Blasia S 220	Blasia S 320
BP	Energol GR-XP 150	Energol GR-XP 220	Energol GR-XP 320	EnersynEPX 150	EnersynEPX 220	EnersynEPX 320	Enesyn SG 150	Enesyn SG 220	Enesyn SG 320
CASTROL	Alpha SP 150	Alpha SP 220	Alpha SP 320	Alphasyn EP 150	Alphasyn EP 220	Alphasyn EP 320	Alphasyn PG 150	Alphasyn PG 220	Alphasyn PG 320
CHEVRON	Ultra Gear 150	Ultra Gear 220	Ultra Gear 320	Tegra Synt. 150	Tegra Synt. 220	Tegra Synt. 320	HiPerSYN 150	HiPerSYN 220	HiPerSYN 320
ESSO	Spartan EP 150	Spartan EP 220	Spartan EP 320	Spartan S EP 150	Spartan S EP 220	Spartan S EP 320	Glycolube 150	Glycolube 220	Glycolube 320
KLUBER	Klüberoil GEM 1-150	Klüberoil GEM 1-220	Klüberoil GEM 1-320	Klübersynth EG 4-150	Klübersynth EG 4-220	Klübersynth EG 4-320	Klübersynth GH 6-150	Klübersynth GH 6-220	Klübersynth GH 6-320
MOLIKOTE	L-0115	L-0122	L-0132	L-1115	L-1122	L-1132	-	-	-
MOBIL	Mobilgear XMP 150	Mobilgear XMP 220	Mobilgear XMP 320	Mobilgear SHC XMP 150	Mobilgear SHC XMP 220	Mobilgear SHC XMP 320	Glygoyle 22	Glygoyle 30	Glygoyle 22
SHELL	Omala 150	Omala 220	Omala 320	Omala HD 150	Omala HD 220	Omala HD 320	Tivela S150	Tivela S220	Tivela S320
TEXACO	Meropa 150	Meropa 220	Meropa 320	Pinnacle EP 150	Pinnacle EP 220	Pinnacle EP 320	-	Synlube CLP 220	Synlube CLP 320
TOTAL	Carter EP 150	Carter EP 220	Carter EP 320	Carter SH 150	Carter SH 220	Carter SH 320	Carter SY 150	Carter SY 220	Carter SY 320
TRIBOL	1100/150	1100/220	1100/320	1510/150	1510/220	1510/320	800\150	800\220	800\320

Genellikle Planet redüktörler yağsız olarak sevk edilirler.

Generally, Planetary Drives are supplied without lubricant.

HINWEIS: saemtliche Getriebe Planetary Drives werden ohne Oelfüllung ausgeliefert.

Yağ Değişimi
Oil Changes
Schmierung

Üretici Manufacturer Hersteller	Hidrolik Yağı Hydraulic oils			Dişli Yağı Gear oils		
	Hydrauliköle			Getriebeöle		
	ISO VG 32	ISO VG 46	ISO VG 68	ISO VG 150	ISO VG 220	ISO VG 320
	AGIP	Rocol Foodlube Hi Power 32	-	-	Rocol Foodlube Hi-Torque 150	-
BP	Enerpar M 32	Enerpar M 46	Enerpar M 68	-	-	
ESSO	Nuto FG 32	Nuto FG 46	Nuto FG 68	-	Gear Oil FM 220	
KLUBER	Summit Hysyn FG 32	Summit Hysyn FG 46	Summit Hysyn FG 68	Klüberoil 4 UH1 N 150	Klüberoil 4 UH1 N 220	Klüberoil 4 UH1 N 320
MOBIL	DTE FM 32	DTE FM 46	DTE FM 68	DTE FM 150	DTE FM 220	DTE FM 320
SHELL	Cassida Fluid HF 32	Cassida Fluid HF 46	Cassida Fluid HF 68	Cassida Fluid GL 150	Cassida Fluid GL 220	Cassida Fluid GL 320
TEXACO	Cygnus Hydraulic Oil 32	Cygnus Hydraulic Oil 46	Cygnus Hydraulic Oil 68	Cygnus Gear PAO 150	Cygnus Gear PAO 220	Cygnus Gear PAO 320
TRIBOL	Food Proof 1840/32	Food Proof 1840/46	Food Proof 1840/68	-	Food Proof 1810/220	Food Proof 1810/320

Kullanılacak olan diğer sentetik yağların NBR tip yağ keçesi ile uyumlu olduğu kontrol edilmeli.

If other synthetic lubricants are used always check their compatibility with the NBR oil seals used in the reduction gear.

Bei Verwendung synthetischer Schmiermittel muss die Kompatibilität mit den im Planetengetriebe montierten Öldichtungen aus NBR geprüft werden.

Farklı tiplerdeki sentetik yağlar birbirine karıştırılmamalıdır.

Do not mix different kinds of synthetic lubricant together.

Unterschiedliche Typen von synthetischen Schmiermitteln dürfen nicht gemischt werden

Eğer planet dişli kutusunun çalışma şartları devamlı olarak 60°C ve üzerinde seyrediyorsa bu durumda sentetik yağ kullanılması sağlık verilerinde dişli kutusu içindeki parçaların aşırı ısınmadan meydana gelebilecek aşınmalardan korunması gerekir. Dişli kutusu içindeki yağ sıcaklığının 90°C yi aşmaması gerekir.

If the operating conditions of the reduction gear entail prolonged periods of operation such to cause the oil temperature to rise considerably (>60°C) we suggest using a synthetic oil to guarantee less wear of the components and to prolong the intervals between replacing them. Maximum temperature of the lubricant inside the reduction gear must not go above 90°C.

Wenn die Betriebsbedingungen vom Planetengetriebe längere Betriebszeiten vorsehen, die zu hohen Öltemperaturen führen (>60°C), wird zur Verwendung von synthetischem Öl geraten, das für einen geringeren Verschleiß der Teile und größere Abstände zwischen den Ölwechseln garantiert. Die Temperatur vom Schmiermittel im Planetengetriebe darf 90°C nicht übersteigen

Montaj ve tapa pozisyonları

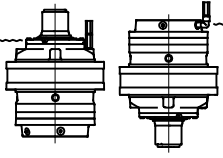
Aşağıdaki resimlerde montaj pozisyonlarını bulabilirsiniz. Sipariş esnasında montaj pozisyonu da bildirilmelidir. Bu şekilde uygun tapalama ve yağ miktarı seçilir.

Mounting positions and plugs position

You can see the possible mounting positions in the figures below. The relative initial must be specified when ordering the reduction gear. The layout and type of plugs as well as the minimum lubricant level are also indicated, as per the legend.

Montageposition und Anordnung der Deckel

Die Abbildungen unten zeigen die möglichen Montagepositionen, deren Kürzel bei der Bestellung vom Planetengetriebe angegeben werden muss. Außerdem sind die Anordnung und der Typ der Deckel sowie der Mindestölstand angegeben (siehe Legende).

		Montaj pozisyonları (lt) 'V1, V2' Mounting positions (lt) 'V1, V2' Einbaulagen (lt) 'V1, V2'							
		MS - MC	FS - FC	HS - HC	SD	SF	S	FVS - C	DKM
IPR 101	S1	-	1,6	1,6	1,6	1,6	-	2,4	1,6
	S2	-	2,1	2,1	2,1	2,1	-	2,9	2,1
	S3	-	2,6	2,6	2,6	2,6	-	3,4	2,6
	S4	-	3,1	3,1	3,1	3,1	-	3,9	3,1
IPR 103	S1	-	1,8	1,8	1,8	1,8	-	2,6	1,8
	S2	-	2,3	2,3	2,3	2,3	-	3,1	2,3
	S3	-	2,8	2,8	2,8	2,8	-	3,6	2,8
	S4	-	3,3	3,3	3,3	3,3	-	4,1	3,3
IPR 105	S1	-	2,8	3,2	2,4	2,8	2,8	4,9	2,8
	S2	-	3,3	3,7	2,9	3,3	3,3	5,4	3,3
	S3	-	3,8	4,2	3,4	3,8	3,8	5,9	3,8
	S4	-	4,3	4,7	3,9	4,3	4,3	6,4	4,3
IPR 107	S1	-	3	3,4	2,6	3	3	5,1	3
	S2	-	3,7	4,1	3,3	3,7	3,7	5,8	3,7
	S3	-	4,2	4,6	3,8	4,2	4,2	6,3	4,2
	S4	-	4,7	5,1	4,3	4,7	4,7	6,8	4,7
IPR 109	S1	-	-	5	5	5	-	10,5	5
	S2	-	-	5,9	5,9	5,9	-	11,4	5,9
	S3	-	-	6,4	6,4	6,4	-	11,9	6,4
	S4	-	-	6,9	6,9	6,9	-	12,4	6,9
IPR 111	S1	-	5,9	-	5,9	5,8	4,5	15,3	5,9
	S2	-	7	-	7	6,9	5,6	16,4	7
	S3	-	7,7	-	7,7	7,6	6,3	17,1	7,7
	S4	-	8,2	-	8,2	8,1	6,8	17,6	8,2
IPR 113	S1	6,4	5,2	-	5,2	6,5	5,2	16	5,2
	S2	7,5	6,3	-	6,3	7,6	6,3	17,1	6,3
	S3	8,2	7	-	7	8,3	7	17,8	7
	S4	8,7	7,5	-	7,5	8,8	7,5	18,3	7,5
IPR 115	S2	8,6	7,4	-	7,4	8,7	7,4	18,2	7,4
	S3	9,5	8,3	-	8,3	9,6	8,3	19,1	8,3
	S4	10	8,8	-	8,8	10,1	8,8	19,6	8,8

Giriş gövdesi aşağıdaki GM28-GM42-GM65-GM80-GM90-GM100 gövdelerden herhangi biri ise yukarıdaki tablodan seçilmiş olan yağ miktarına aşağıdaki değerler eklenir.

If the reduction gear inlet body is any of the following GM28-GM42-GM65-GM80-GM90-GM100 bodies, the following values are added to the oil quantity selected from the table above.

Wenn es sich bei dem Einlasskörper des Untersetzungsgetriebes um einen der folgenden GM28-GM42-GM65-GM80-GM90-GM100 Körper handelt, werden die folgenden Werte zu der aus der obigen Tabelle ausgewählten Ölmenge addiert.

GM28-GM42	GM65	GM80	GM90-GM100
0,6	1,4	2	2,8

Katalogta verilmiş olan tüm değerler litre (L) cinsindedir.

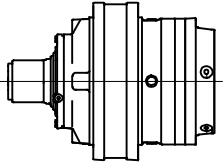
All values given in the catalog are in liters (L).

Alle im Katalog angegebenen Werte sind in Litern (L) angegeben.

Planet redüktörlerimiz talep edilmediği sürece yağsız sevk edilecektir.

Generally, Planetary Drives are supplied without lubricant.

Im Allgemeinen werden Planetenantriebe ohne Schmiermittel geliefert.

		Montaj pozisyonları (lt) 'H' Mounting positions (lt) 'H' Einbaulagen (lt) 'H'							
		MS - MC	FS - FC	HS - HC	SD	SF	S	FVS - C	DKM
IPR 101	S1	-	0,8	0,8	0,8	0,8	-	1,6	0,8
	S2	-	1,1	1,1	1,1	1,1	-	1,9	1,1
	S3	-	1,3	1,3	1,3	1,3	-	2,1	1,3
	S4	-	1,6	1,6	1,6	1,6	-	2,4	1,6
IPR 103	S1	-	0,9	0,9	0,9	0,9	-	1,70	0,9
	S2	-	1,2	1,2	1,2	1,2	-	2	1,2
	S3	-	1,4	1,4	1,4	1,4	-	2,2	1,4
	S4	-	1,7	1,7	1,7	1,7	-	2,5	1,7
IPR 105	S1	-	1,4	1,6	1,2	1,4	1,4	3,8	1,4
	S2	-	1,7	1,9	1,5	1,7	1,7	4,1	1,7
	S3	-	1,9	2,1	1,7	1,9	1,9	4,3	1,9
	S4	-	2,2	2,4	2	2,2	2,2	4,6	2,2
IPR 107	S1	-	1,5	1,7	1,3	1,5	1,5	3,9	1,5
	S2	-	1,9	2,1	1,7	1,9	1,9	4,3	1,9
	S3	-	2,1	2,3	1,9	2,1	2,1	4,5	2,1
	S4	-	2,4	2,6	2,2	2,4	2,4	4,8	2,4
IPR 109	S1	-	-	2,5	2,5	2,5	-	7,6	2,5
	S2	-	-	3	3	3	-	8	3
	S3	-	-	3,2	3,2	3,2	-	8,3	3,2
	S4	-	-	3,5	3,5	3,5	-	8,5	3,5
IPR 111	S1	-	3	-	3	2,9	2,3	11,2	3
	S2	-	3,5	-	3,5	3,5	2,8	11,7	3,5
	S3	-	3,9	-	3,9	3,8	3,2	12,1	3,9
	S4	-	4,1	-	4,1	4,1	3,4	12,3	4,1
IPR 113	S1	3,2	2,6	-	2,6	3,3	2,6	11,5	2,6
	S2	3,8	3,2	-	3,2	3,8	3,2	12,1	3,2
	S3	4,1	3,5	-	3,5	4,2	3,5	12,4	3,5
	S4	4,4	3,8	-	3,8	4,4	3,8	12,7	3,8
IPR 115	S2	4,3	3,7	-	3,7	4,4	3,7	12,6	3,7
	S3	4,8	4,2	-	4,2	4,8	4,2	13,1	4,2
	S4	5	4,4	-	4,4	5,1	4,4	13,3	4,4

Giriş gövdesi aşağıdaki GM28-GM42-GM65-GM80-GM90-GM100 gövdelerden herhangi biri ise yukarıdaki tablodan seçilmiş olan yağ miktarına aşağıdaki değerler eklenir.

If the reduction gear inlet body is any of the following GM28-GM42-GM65-GM80-GM90-GM100 bodies, the following values are added to the oil quantity selected from the table above.

Wenn es sich bei dem Einlasskörper des Untersetzungsgetriebes um einen der folgenden GM28-GM42-GM65-GM80-GM90-GM100 Körper handelt, werden die folgenden Werte zu der aus der obigen Tabelle ausgewählten Ölmenge addiert.

GM28-GM42	GM65	GM80	GM90-GM100
0,3	0,7	1	1,4

Katalogda verilmiş olan tüm değerler litre (L) cinsindedir.

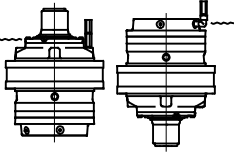
All values given in the catalog are in liters (L).

Alle im Katalog angegebenen Werte sind in Litern (L) angegeben.

Planet redüktörlerimiz talep edilmediği sürece yağsız sevk edilecektir.

Generally, Planetary Drives are supplied without lubricant.

Im Allgemeinen werden Planetenantriebe ohne Schmiermittel geliefert.

		Montaj pozisyonları (lt) 'V1, V2' Mounting positions (lt) 'V1, V2' Einbaulagen (lt) 'V1, V2'							
		MS - MC	FS - FC	HS - HC	SD	SF	S	FVS - C	DKM
IPR 117	S1	13,2	13	-	8,4	-	8,1	13,2	8,4
	S2	15,2	15	-	10,4	-	10,1	15,2	10,4
	S3	16,1	15,9	-	11,3	-	11	16,1	11,3
	S4	16,6	16,4	-	11,8	-	11,5	16,6	11,8
IPR 119	S2	15	14,8	-	10,2	-	9,9	15	-
	S3	16,1	15,9	-	11,3	-	11	16,1	-
	S4	16,8	16,6	-	12	-	11,7	16,8	-
IPR 121	S1	11,3	-	-	7,4	-	7,4	11,3	-
	S2	14,4	-	-	10,5	-	10,5	14,4	-
	S3	15,5	-	-	11,6	-	11,6	15,5	-
	S4	16,2	-	-	12,3	-	12,3	16,2	-
IPR 123	S1	18,4	18,4	-	15,5	-	15,5	18,4	-
	S2	21,5	21,5	-	18,6	-	18,6	21,5	-
	S3	22,6	22,6	-	19,7	-	19,7	22,6	-
	S4	23,3	23,3	-	20,4	-	20,4	23,3	-
IPR 125	S1	21,2	21,2	-	18,3	-	18,3	21,2	-
	S2	27,1	27,1	-	24,2	-	24,2	27,1	-
	S3	29,1	29,1	-	26,2	-	26,2	29,1	-
	S4	30	30	-	27,1	-	27,1	30	-
IPR 127	S1	29,6	-	-	29,6	-	29,6	29,6	-
	S2	35,5	-	-	35,5	-	35,5	35,5	-
	S3	37,5	-	-	37,5	-	37,5	37,5	-
	S4	38,4	-	-	38,4	-	38,4	38,4	-
IPR 129	S1	30,3	-	-	30,3	-	30,3	30,3	-
	S2	39,3	-	-	39,3	-	39,3	39,3	-
	S3	42,4	-	-	42,4	-	42,4	42,4	-
	S4	43,5	-	-	43,5	-	43,5	43,5	-
IPR 133	S1	55,8	-	-	55,8	-	55,8	55,8	-
	S2	64,8	-	-	64,8	-	64,8	64,8	-
	S3	67,9	-	-	67,9	-	67,9	67,9	-
	S4	69	-	-	69	-	69	69	-

Giriş gövdesi aşağıdaki GM28-GM42-GM65-GM80-GM90-GM100 gövdelerden herhangi biri ise yukarıdaki tablodan seçilmiş olan yağ miktarına aşağıdaki değerler eklenir.

If the reduction gear inlet body is any of the following GM28-GM42-GM65-GM80-GM90-GM100 bodies, the following values are added to the oil quantity selected from the table above.

Wenn es sich bei dem Einlasskörper des Untersetzungsgetriebes um einen der folgenden GM28-GM42-GM65-GM80-GM90-GM100 Körper handelt, werden die folgenden Werte zu der aus der obigen Tabelle ausgewählten Ölmenge addiert.

GM28-GM42	GM65	GM80	GM90-GM100
0,6	1,4	2	2,8

Katalogta verilmiş olan tüm değerler litre (L) cinsindedir.

All values given in the catalog are in liters (L).

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Planet redüktörlerimiz talep edilmediği sürece yağsız sevk edilecektir.

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Im Allgemeinen werden Planetenantriebe ohne Schmiermittel geliefert.

		Montaj pozisyonları (lt) 'H' Mounting positions (lt) 'H' Einbaulagen (lt) 'H'							
		MS - MC	FS - FC	HS - HC	SD	SF	S	FVS - C	DKM
IPR 117	S1	6,6	6,5	-	4,2	-	4,1	6,6	4,2
	S2	7,6	7,5	-	5,2	-	5,1	7,6	5,2
	S3	8,1	8	-	5,7	-	5,5	8,1	5,7
	S4	8,3	8,2	-	5,9	-	5,8	8,3	5,9
IPR 119	S2	7,5	7,4	-	5,1	-	5	7,5	-
	S3	8,1	8	-	5,7	-	5,5	8,1	-
	S4	8,4	8,3	-	6	-	5,9	8,4	-
IPR 121	S1	5,7	-	-	3,7	-	3,7	5,7	-
	S2	7,2	-	-	5,3	-	5,3	7,2	-
	S3	7,8	-	-	5,8	-	5,8	7,8	-
	S4	8,1	-	-	6,2	-	6,2	8,1	-
IPR 123	S1	9,2	9,2	-	7,8	-	7,8	9,2	-
	S2	10,8	10,8	-	9,3	-	9,3	10,8	-
	S3	11,3	11,3	-	9,9	-	9,9	11,3	-
	S4	11,7	11,7	-	10,2	-	10,2	11,7	-
IPR 125	S1	10,6	10,6	-	9,2	-	9,2	10,6	-
	S2	13,6	13,6	-	12,1	-	12,1	13,6	-
	S3	14,6	14,6	-	13,1	-	13,1	14,6	-
	S4	15	15	-	13,6	-	13,6	15	-
IPR 127	S1	14,8	-	-	14,8	-	14,8	14,8	-
	S2	17,8	-	-	17,8	-	17,8	17,8	-
	S3	18,8	-	-	18,8	-	18,8	18,8	-
	S4	19,2	-	-	19,2	-	19,2	19,2	-
IPR 129	S1	15,2	-	-	15,2	-	15,2	15,2	-
	S2	19,7	-	-	19,7	-	19,7	19,7	-
	S3	21,2	-	-	21,2	-	21,2	21,2	-
	S4	21,8	-	-	21,8	-	21,8	21,8	-
IPR 133	S1	27,9	-	-	27,9	-	27,9	27,9	-
	S2	32,4	-	-	32,4	-	32,4	32,4	-
	S3	34	-	-	34	-	34	34	-
	S4	34,5	-	-	34,5	-	34,5	34,5	-

Giriş gövdesi aşağıdaki GM28-GM42-GM65-GM80-GM90-GM100 gövdelerden herhangi biri ise yukarıdaki tablodan seçilmiş olan yağ miktarına aşağıdaki değerler eklenir.

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Wenn es sich bei dem Einlasskörper des Untersetzungsgetriebes um einen der folgenden GM28-GM42-GM65-GM80-GM90-GM100 Körper handelt, werden die folgenden Werte zu der aus der obigen Tabelle ausgewählten Ölmenge addiert.

GM28-GM42	GM65	GM80	GM90-GM100
0,3	0,7	1	1,4

Katalogda verilmiş olan tüm değerler litre (L) cinsindedir.

All values given in the catalog are in liters (L).

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Planet redüktörlerimiz talep edilmediği sürece yağsız sevk edilecektir.

Generally, Planetary Drives are supplied without lubricant.

Im Allgemeinen werden Planetenantriebe ohne Schmiermittel geliefert.

		Montaj pozisyonları (lt) 'H1, V1, V2' Mounting positions (lt) 'H1, V1, V2' Einbaulagen (lt) 'H1, V1, V2'							
		MS - MC	FS - FC	HS - HC	SD	SF	S	FVS - C	DKM
IPRK 101	S2	-	2,9	2,9	2,9	2,9	-	3,7	2,9
	S3	-	3,4	3,4	3,4	3,4	-	4,2	3,4
	S4	-	3,9	3,9	3,9	3,9	-	4,7	3,9
IPRK 103	S2	-	3,1	3,1	3,1	3,1	-	3,9	3,1
	S3	-	3,6	3,6	3,6	3,6	-	4,4	3,6
	S4	-	4,1	4,1	4,1	4,1	-	4,9	4,1
IPRK 105	S2	-	4,1	4,5	3,7	4,1	4,1	6,2	4,1
	S3	-	4,6	5	4,2	4,6	4,6	6,7	4,6
	S4	-	5,1	5,5	4,7	5,1	5,1	7,2	5,1
IPRK 107	S2	-	6,2	6,6	5,8	6,2	6,2	8,3	6,2
	S3	-	5	5,4	4,6	5	5	7,1	5
	S4	-	5,5	5,9	5,1	5,5	5,5	7,6	5,5
IPRK 109	S2	-	-	11,3	11,3	11,3	-	16,8	11,3
	S3	-	-	7,2	7,2	7,2	-	12,7	7,2
	S4	-	-	7,7	7,7	7,7	-	13,2	7,7
IPRK 111	S2	-	13,5	-	13,5	13,4	12,1	22,9	13,5
	S3	-	10,2	-	10,2	10,1	8,8	19,6	10,2
	S4	-	9	-	9	8,9	7,6	18,4	9
IPRK 113	S2	14	12,8	-	12,8	14,1	12,8	23,6	12,8
	S3	10,7	9,5	-	9,5	10,8	9,5	20,3	9,5
	S4	9,5	8,3	-	8,3	9,6	8,3	19,1	8,3
IPRK 115	S3	14,9	13,7	-	13,7	15	13,7	24,5	13,7
	S4	10,8	9,6	-	9,6	10,9	9,6	20,4	9,6
IPRK 117	S2	26,2	26	-	21,4	-	21,1	26,2	21,4
	S3	21,5	21,3	-	16,7	-	16,4	21,5	16,7
	S4	19,3	19,1	-	14,5	-	14,2	19,3	14,5
IPRK 119	S3	22,6	22,4	-	17,8	-	17,5	22,6	-
	S4	19,3	19,1	-	14,5	-	14,2	19,3	-
IPRK 121	S2	24,3	-	-	20,4	-	20,4	24,3	-
	S3	22	-	-	18,1	-	18,1	22	-
	S4	18,7	-	-	14,8	-	14,8	18,7	-
IPRK 123	S2	45,4	45,4	-	42,5	-	42,5	45,4	-
	S3	29,1	29,1	-	26,2	-	26,2	29,1	-
	S4	25,8	25,8	-	22,9	-	22,9	25,8	-
IPRK 125	S2	48,2	48,2	-	45,3	-	45,3	48,2	-
	S3	40,1	40,1	-	37,2	-	37,2	40,1	-
	S4	35,4	35,4	-	32,5	-	32,5	35,4	-
IPRK 127	S3	48,5	-	-	48,5	-	48,5	48,5	-
	S4	43,8	-	-	43,8	-	43,8	43,8	-
IPRK 129	S3	66,3	-	-	66,3	-	66,3	66,3	-
	S4	50	-	-	50	-	50	50	-
IPRK 133	S3	91,8	-	-	91,8	-	91,8	91,8	-
	S4	75,5	-	-	75,5	-	75,5	75,5	-

Giriş gövdesi aşağıdaki GM28-GM42-GM65-GM80-GM90-GM100 gövdelerden herhangi biri ise yukarıdaki tablodan seçilmiş olan yağ miktarına aşağıdaki değerler eklenir.

If the reduction gear inlet body is any of the following GM28-GM42-GM65-GM80-GM90-GM100 bodies, the following values are added to the oil quantity selected from the table above.

Wenn es sich bei dem Einlasskörper des Untersetzungsgetriebes um einen der folgenden GM28-GM42-GM65-GM80-GM90-GM100 Körper handelt, werden die folgenden Werte zu der aus der obigen Tabelle ausgewählten Ölmenge addiert.

GM28-GM42	GM65	GM80	GM90-GM100
0,6	1,4	2	2,8

Katalogta verilmiş olan tüm değerler litre (L) cinsindedir.

All values given in the catalog are in liters (L).

Alle im Katalog angegebenen Werte sind in Litern (L) angegeben.

Planet redüktörlerimiz talep edilmediği sürece yağsız sevk edilecektir.

Generally, Planetary Drives are supplied without lubricant.

Im Allgemeinen werden Planetenaggregate ohne Schmiermittel geliefert.



		Montaj pozisyonları (lt) 'H2, H4' Mounting positions (lt) 'H2, H4' Einbaulagen (lt) 'H2, H4'							
		MS - MC	FS - FC	HS - HC	SD	SF	S	FVS - C	DKM
IPRK 101	S2	-	1,5	1,5	1,5	1,5	-	2,3	1,5
	S3	-	1,7	1,7	1,7	1,7	-	2,5	1,7
	S4	-	2	2	2	2	-	2,8	2
IPRK 103	S2	-	1,6	1,6	1,6	1,6	-	2,4	1,6
	S3	-	1,8	1,8	1,8	1,8	-	2,6	1,8
	S4	-	2,1	2,1	2,1	2,1	-	2,9	2,1
IPRK 105	S2	-	2,1	2,3	1,9	2,1	2,1	4,5	2,1
	S3	-	2,3	2,5	2,1	2,3	2,3	4,7	2,3
	S4	-	2,6	2,8	2,4	2,6	2,6	5	2,6
IPRK 107	S2	-	3,1	3,3	2,9	3,1	3,1	5,5	3,1
	S3	-	2,5	2,7	2,3	2,5	2,5	4,9	2,5
	S4	-	2,8	3	2,6	2,8	2,8	5,2	2,8
IPRK 109	S2	-	-	5,7	5,7	5,7	-	10,7	5,7
	S3	-	-	3,6	3,6	3,6	-	8,7	3,6
	S4	-	-	3,9	3,9	3,9	-	8,9	3,9
IPRK 111	S2	-	6,8	-	6,8	6,7	6,1	15	6,8
	S3	-	5,1	-	5,1	5,1	4,4	13,3	5,1
	S4	-	4,5	-	4,5	4,5	3,8	12,7	4,5
IPRK 113	S2	7	6,4	-	6,4	7,1	6,4	15,3	6,4
	S3	5,4	4,8	-	4,8	5,4	4,8	13,7	4,8
	S4	4,8	4,2	-	4,2	4,8	4,2	13,1	4,2
IPRK 115	S3	7,5	6,9	-	6,9	7,5	6,9	15,8	6,9
	S4	5,4	4,8	-	4,8	5,5	4,8	13,7	4,8
IPRK 117	S2	13,1	13	-	10,7	-	10,6	13,1	10,7
	S3	10,8	10,7	-	8,4	-	8,2	10,8	8,4
	S4	9,7	9,6	-	7,3	-	7,1	9,7	7,3
IPRK 119	S3	11,3	11,2	-	8,9	-	8,8	11,3	-
	S4	9,7	9,6	-	7,3	-	7,1	9,7	-
IPRK 121	S2	12,2	-	-	10,2	-	10,2	12,2	-
	S3	11	-	-	9,1	-	9,1	11	-
	S4	9,4	-	-	7,4	-	7,4	9,4	-
IPRK 123	S2	22,7	22,7	-	21,3	-	21,3	22,7	-
	S3	14,6	14,6	-	13,1	-	13,1	14,6	-
	S4	12,9	12,9	-	11,5	-	11,5	14,5	-
IPRK 125	S2	24,1	24,1	-	22,7	-	22,7	24,1	-
	S3	20,1	20,1	-	18,8	-	18,8	20,1	-
	S4	17,7	17,7	-	16,3	-	16,3	17,7	-
IPRK 127	S3	24,3	-	-	24,3	-	24,3	24,3	-
	S4	21,9	-	-	21,9	-	21,9	21,9	-
IPRK 129	S3	33,2	-	-	33,2	-	33,2	33,2	-
	S4	25	-	-	25	-	25	25	-
IPRK 133	S3	45,9	-	-	45,9	-	45,9	45,9	-
	S4	37,8	-	-	37,8	-	37,8	37,8	-

Giriş gövdesi aşağıdaki GM28-GM42-GM65-GM80-GM90-GM100 gövdelerden herhangi biri ise yukarıdaki tablodan seçilmiş olan yağ miktarına aşağıdaki değerler eklenir.

If the reduction gear inlet body is any of the following GM28-GM42-GM65-GM80-GM90-GM100 bodies, the following values are added to the oil quantity selected from the table above.

Wenn es sich bei dem Einlasskörper des Untersetzungsgetriebes um einen der folgenden GM28-GM42-GM65-GM80-GM90-GM100 Körper handelt, werden die folgenden Werte zu der aus der obigen Tabelle ausgewählten Ölmenge addiert.

GM28-GM42	GM65	GM80	GM90-GM100
0,3	0,7	1	1,4

Katalogda verilmiş olan tüm değerler litre (L) cinsindedir.

All values given in the catalog are in liters (L).

Alle im Katalog angegebenen Werte sind in Litern (L) angegeben.

Planet redüktörlerimiz talep edilmediği sürece yağsız sevk edilecektir.

Generally, Planetary Drives are supplied without lubricant.

Im Allgemeinen werden Planetenantriebe ohne Schmiermittel geliefert.



		Montaj pozisyonları (lt) 'H3' Mounting positions (lt) 'H3' Einbaulagen (lt) 'H3'							
		MS - MC	FS - FC	HS - HC	SD	SF	S	FVS - C	DKM
IPRK 101	S2	-	2	2	2	2	-	2,8	2
	S3	-	2,2	2,2	2,2	2,2	-	3	2,2
	S4	-	2,5	2,5	2,5	2,5	-	3,3	2,5
IPRK 103	S2	-	2,1	2,1	2,1	2,1	-	2,9	2,1
	S3	-	2,3	2,3	2,3	2,3	-	3,1	2,3
	S4	-	2,6	2,6	2,6	2,6	-	3,4	2,6
IPRK 105	S2	-	2,6	2,8	2,4	2,6	2,6	5	2,6
	S3	-	2,8	3	2,6	2,8	2,8	5,2	2,8
	S4	-	3,1	3,3	2,9	3,1	3,1	5,5	3,1
IPRK 107	S2	-	3,7	3,9	3,5	3,7	3,7	6,1	3,7
	S3	-	3	3,2	2,8	3	3	5,4	3
	S4	-	3,3	3,5	3,1	3,3	3,3	5,7	3,3
IPRK 109	S2	-	-	6,6	6,6	6,6	-	11,6	6,6
	S3	-	-	4,1	4,1	4,1	-	9,2	4,1
	S4	-	-	4,4	4,4	4,4	-	9,4	4,4
IPRK 111	S2	-	8,7	-	8,7	8,2	8	16,9	8,7
	S3	-	5,7	-	5,7	5,6	5	13,9	5,7
	S4	-	5	-	5	5	4,3	13,2	5
IPRK 113	S2	9	8,4	-	8,4	9	8,4	17,3	8,4
	S3	5,9	5,3	-	5,3	6	5,3	14,2	5,3
	S4	5,3	4,7	-	4,7	5,3	4,7	13,6	4,7
IPRK 115	S3	8,4	7,8	-	7,8	8,4	7,8	16,7	7,8
	S4	5,9	5,3	-	5,3	6	5,3	14,2	5,3
IPRK 117	S2	15,4	15,3	-	13	-	12,8	15,4	13
	S3	11,7	11,6	-	9,3	-	9,1	11,7	9,3
	S4	10,2	10,1	-	7,8	-	7,7	10,2	7,8
IRP 119	S3	13,3	13,2	-	10,9	-	10,7	13,3	-
	S4	10,2	10,1	-	7,8	-	7,7	10,2	-
IPRK 121	S2	14,4	-	-	12,5	-	12,5	14,4	-
	S3	13	-	-	11	-	11	13	-
	S4	9,9	-	-	8	-	8	9,9	-
IPRK 123	S2	23,6	23,6	-	22,1	-	22,1	23,6	-
	S3	16,5	16,5	-	15,1	-	15,1	16,5	-
	S4	15,4	15,4	-	13,9	-	13,9	15,4	-
IPRK 125	S2	25	25	-	23,5	-	23,5	25	-
	S3	22,3	22,3	-	20,9	-	20,9	22,3	-
	S4	18,6	18,6	-	17,2	-	17,2	18,6	-
IPRK 127	S3	26,5	-	-	26,5	-	26,5	26,5	-
	S4	22,8	-	-	22,8	-	22,8	22,8	-
IPRK 129	S3	34	-	-	34	-	34	34	-
	S4	27	-	-	27	-	27	27	-
IPRK 133	S3	46,8	-	-	46,8	-	46,8	46,8	-
	S4	39,7	-	-	39,7	-	39,7	39,7	-

Giriş gövdesi aşağıdaki GM28-GM42-GM65-GM80-GM90-GM100 gövdelerden herhangi biri ise yukarıdaki tablodan seçilmiş olan yağ miktarına aşağıdaki değerler eklenir.

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GM28-GM42	GM65	GM80	GM90-GM100
0,6	1,4	2	2,8

Katalogta verilmiş olan tüm değerler litre (L) cinsindedir.

All values given in the catalog are in liters (L).

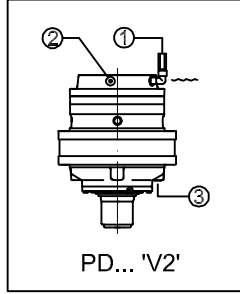
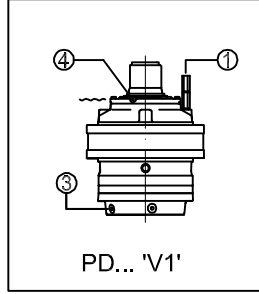
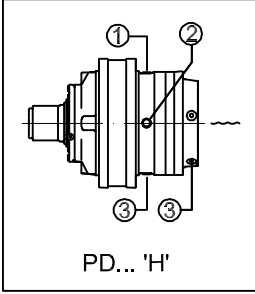
Alle im Katalog angegebenen Werte sind in Litern (L) angegeben.

Planet redüktörlerimiz talep edilmediği sürece yağsız sevk edilecektir.

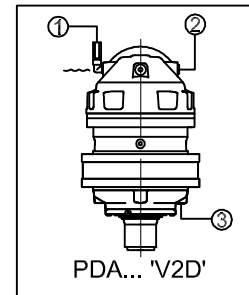
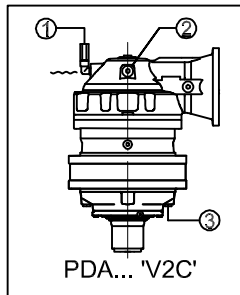
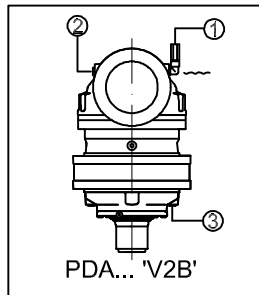
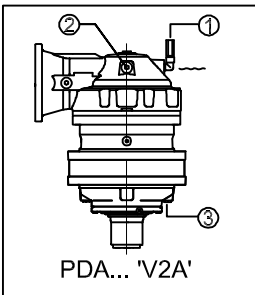
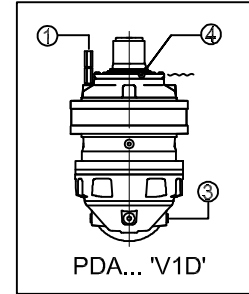
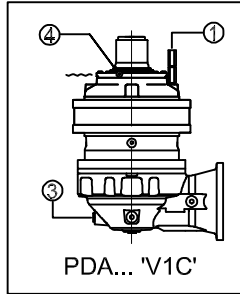
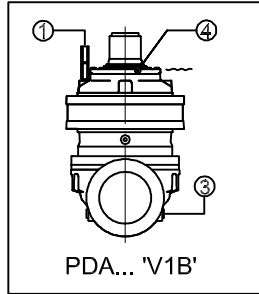
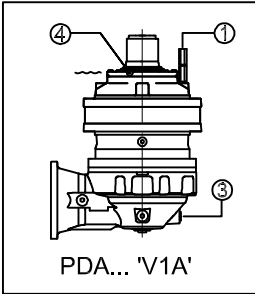
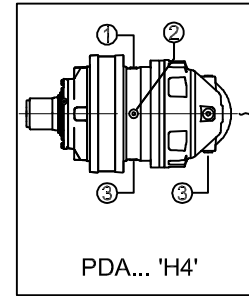
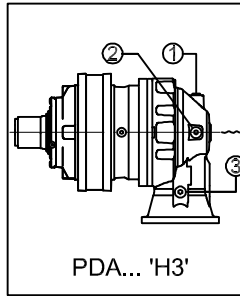
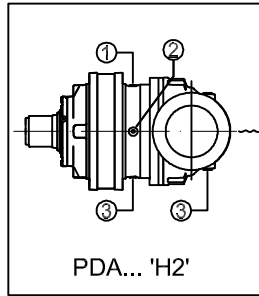
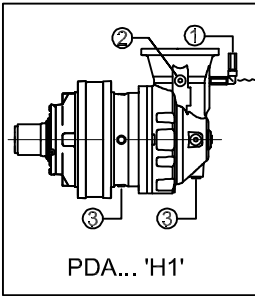
Generally, Planetary Drives are supplied without lubricant.

Im Allgemeinen werden Planetenaggregate ohne Schmiermittel geliefert.

Montaj Pozisyonları	Mounting Positions	Montageposition
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①	Nefeslik/ Vent plug Entlüftungstopfen
②	Seviye / Level plug Ölstandstopfen
③	Boşaltma / Drainage Ablassstopfen
④	Doldurma / Filling Einfüllstopfen



Sipariş esnasında montaj pozisyonunu dikkatlice belirtilmesi doğru tapan yerleşimi için gereklidir.

Please specify the mounting position carefully with the order for the correct plugging.

Bitte geben Sie die Position Montage sorgfältig mit dem Auftrag für die korrekte plugging.

Genleşme Tankı

Expansion Tank

Ausgleichsbehälter

Dikey montaj uygulamalarında , genleşen yağın toplanması için genleşme kabı kullanılması tavsiye edilir. Bu düzenek talep halinde servisedilir.

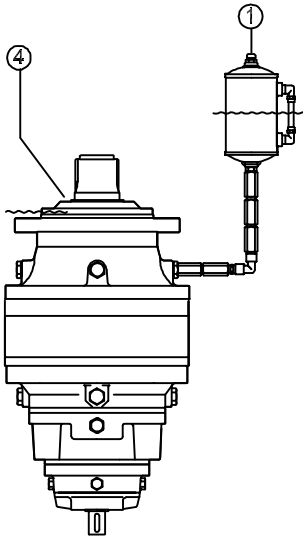
For vertical applications, it is recommended to use an expansion tank that can absorb any oil expansions and/or ensure topping up in hard to reach places. This fitting can be supplied on request.

Fuer die vertikalen Einbaupositionen ist die Ausruestung mit einem Oelausgleichsbehaelter zu empfehlen. Dadurch ist gegeben, dass eventuelle Oeluebertritte vermieden und eine einfache Befuellung ermoeoglicht wird. Der Behaelter ist auf Nachfrage lieferbar.

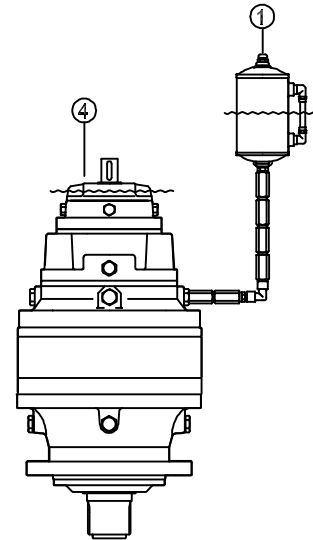
Genleşme tankı redüktör üzerine öyle yerleştirilmelidirki, yağ seviyesi tüp üzerindeki ufak göstergelerden görünecek şekilde montaj pozisyonuna göre en üst seviyede ve daima nefeslik tapasının altında olmalıdır.

The expansion tank must always be placed so the level of oil, which can be seen by means of a small transparent tube placed in parallel with the tank for instance (standard in some kits), is above the highest point you wish to lubricate and, hence, above the venting plugs (4).

Das Ausdehnungsgefäß muss so positioniert sein, dass sich der Ölstand, der zum Beispiel über eine durchsichtige Ölstandsanzeige parallel zum Gefäß (serienmäßig bei einigen Kits) angezeigt wird, oberhalb der höchsten Stelle befindet, die geschmiert werden soll, und damit oberhalb der Entlüftungsdeckel (4).



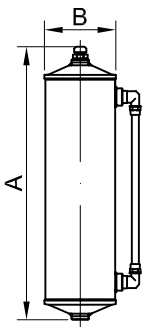
- ① Doldurma ve havalandırma
Filling up and venting
Füllen und Entlüften
- ④ Doldurma ve havalandırma
Venting while filling up
Entlüften beim Füllen
- Minimum seviye
Minimum level
Mindestölstand



Aşağıdaki tablodan uygun tank tipi seçilir.

Please refer to the following table and relative figure for the sales codes and technical specifications of the tank kits.

Die Bestellnummern und technischen Daten der Kits für Ausdehnungsgefäße können der Tabelle unten und der dazugehörigen Abbildung entnommen werden.



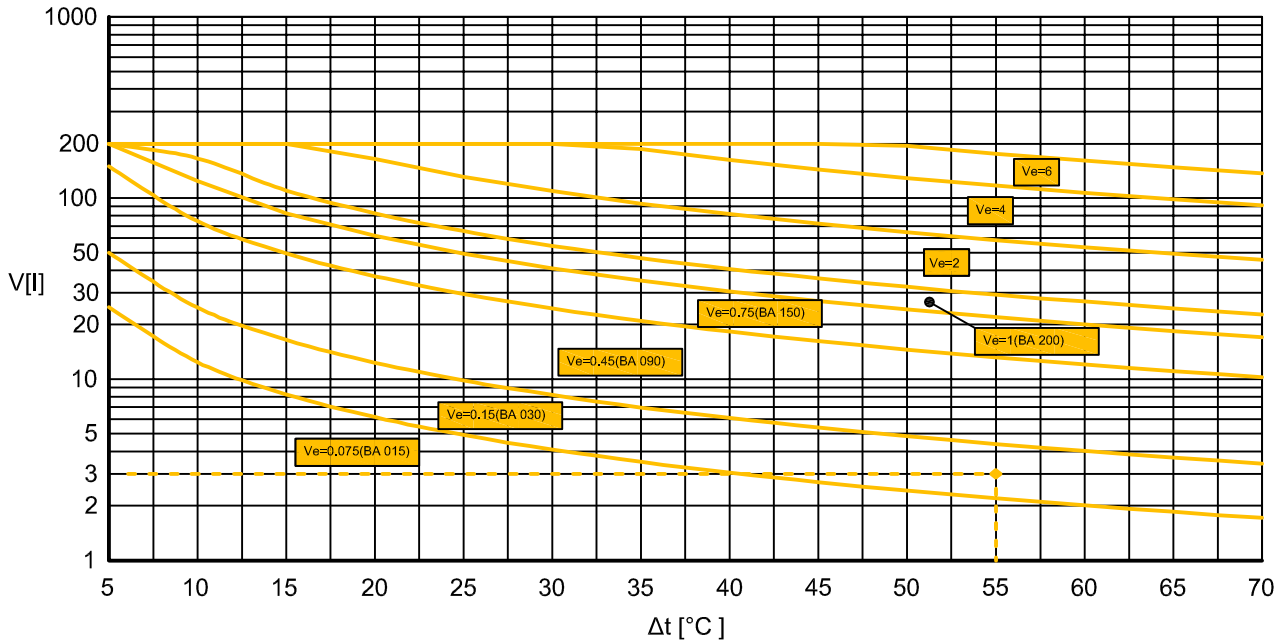
ET...

Tip/Type/Typ	A (mm)	B (mm)	Kapasite / Capacity Fassung-vermögen [ml]
ET 150	115	60	135
ET 300	155	75	290
ET 1000	200	110	900
ET 1500	235	110	1500
ET 2000	300	120	2000

Genleşme tankının seçimi genişleyen yağ miktarının hacmine V_e bağlı olarak yapılır. Bu seçim aşağıdaki yol ile yapılır. Aşağıdaki grafikte, Δt farkını planet dişli kutusunun içindeki yağ sıcaklığı ile ortam sıcaklığının farkı alınır. ve redüktör içindeki grekli yağ hacmi V eksenine ile Δ sıcaklık farkı eksenine birleştirilir. Bulunan nokta genişleyen yağ miktarı V_e yi verir. V_e tank bu hacmin iki misli olarak seçilir.

The choice of tank should be based on the volume of expanded oil V_e ; this can be found in the following way: in the following graph, find the point which has Δt difference between the reduction gear's oil temperature and ambient temperature as the abscissa and volume V of oil necessary to fill the reduction gear as the ordinate. On the basis of the area in which the point falls, you find the volume of expanded oil V_e and the tank is sized for double the volume calculated.

Für die Auswahl vom Behälter ist das Volumen vom ausgedehnten Öl V_e entscheidend, das wie folgt ermittelt werden kann: Auf der Grafik den Punkt ermitteln, dessen X-Koordinate die Differenz Δt zwischen der Öltemperatur im Getriebe und der Umgebungstemperatur ist und dessen Y-Koordinate das Volumen V vom Öl, das zum Füllen vom Getriebe erforderlich ist. Anhand des Bereichs auf der Grafik, in den der Punkt fällt, kann das Volumen V_e vom ausgedehnten Öl ermittelt werden. Der Behälter wird dann auf das doppelte Volumen des errechneten Werts ausgelegt.



Örnek

3 litre yağ kapasitesi olan bir planet dişli redüktör, 80°C de çalışıyor ve ortam sıcaklığı 25°C olan şartlarda bulunuyor. $\Delta t = 80 - 25 = 55^\circ\text{C}$ derecesini Δt ekseninden 3 litreyi de V ekseninden alarak kesişirelim. Bulunan noktanın genişleyen yağ miktarı $V_e = 0,15$ litre alanında olduğu grafikten bulunur. Bu durumda tavsiye edilen tank hacmi iki misli olarak 0,30 litre olarak seçilir. Devam eden sayfalarda montaj şekline göre redüktörlerin yağ miktarları verilmiştir.

Example

Consider a reduction gear with an oil capacity of 3 litres at an operating temperature of 80°C and with an ambient temperature of 25°C. Finding the abscissa $\Delta t = 80 - 25 = 55^\circ\text{C}$ and ordinate $V = 3$ litres point on the graph, it belongs to the area with an expanded volume of $V_e = 0,15$ litres. The tank recommended should have a volume double that of V_e - that is 0.30 litres - so the ideal tank is the BA 030. On the following pages you will find the volumes of oil, purely indicative, necessary to fill up according to the assembly position.

Beispiel

Es wird von einem Getriebe mit einem Ölfassungsvermögen von 3 Litern bei Betriebstemperatur 80°C und Umgebungstemperatur 25°C ausgegangen. Es wird ein Punkt mit der X-Koordinate $\Delta t = 80 - 25 = 55^\circ\text{C}$ und der Y-Koordinate $V = 3$ ermittelt, der in den Bereich mit ausgedehntem Volumen von $V_e = 0,15$ lt fällt. Der Behälter sollte das Doppelte von V_e fassen, also 0,30 Liter. Geeignet ist damit der Behälter BA 030. Auf den folgenden Seiten sind reine Richtwert für die Ölmenge angegeben, die zum Füllen in der entsprechenden Montageposition erforderlich sind.

WARRANTY CONDITIONS

1. All gearboxes and variators' parts except the engine are warranted for 2(two) year.
2. Conditions in the warranty and user's guide of manufacturer are valid for the Warranty of the Engine.
3. This warranty is valid if there is no direct or indirect intervention to the product by the end user and if it is used accordingly to the user's guide.
4. This warranty does not cover the defects arising from misuse and wrong choices.
5. The time taken for maintenance, repair and replacement made under the warranty shall be added to warranty period. This time starts with the delivery of the product to the service station.
6. Warranty period is valid beginning the invoice date, commissioning date is void.
7. No interference such as mounting, demounting, or maintenance shall be made to the warranted product on the machine or facility it works.
8. Our company does not warrant the parts of other companies which are mounted on our standard product; related company is responsible for the warranty of these products.
9. Warranty conditions cover the parts produced by İ-mak Gearbox&Variator Co.; do not cover the customer parts coming with the standard product and damages caused while mounting and demounting these parts.
10. This warranty does not cover the damages that may be occurred during transportation.
11. Consumers have to inform the manufacturer about their questions on maintenance and repair.
12. İ-mak Gearbox&Variator Co. is not responsible for the material and moral losses in case of the failure of the product.
13. Our company will supply a free of charge repair in its factory for the product failures under the conditions and period of warranty. Cost of shipment is borne by the user.
14. Only the replaced parts of the products, on which revisions are made, are warranted; warrant period for the spare parts is 6(six) months.

WARRANTY

İ.Mak Gearbox&Variator products and all parts except electrical motor and faulty choices are warranted on condition that they are used accordingly to the user's guide and not maintained, repaired or interfered by any other individuals other than İ.Mak Gearbox&Variator Service Employees, against defects in material, workmanship and manufacturing for 2(two) year.

All costs relating to workmanship and replacement of parts regarding the work performed within the extent of warranty shall be borne by our company.

The time used for repairs to be made within the warranty period shall be added to warranty period.

Power(kW):

Ratio (i):

Type:

Serial Number:

Date:

Manufacturer:

İ-Mak Gearbox & Variator Co.

Factory : Sanayi Caddesi No. 1 Seyhli Pendik – ISTANBUL

Tel: +90 216 378 03 26 Fax: +90 216 378 06 86

Office : Demirkapi Keresteciler Sitesi Rıza Uzun Sokak

No: 21 34030 Topçular – ISTANBUL

Tel: +90 212 567 87 32-33 Fax: +90 212 612 61 17

Authorized Signature/Seal

User Company :

**MANUFACTURER'S DECLARATION IN ACCORDANCE
WITH THE EC MACHINERY DIRECTIVE 98/37/EC**

ANEXIIB

BELGE NO / AY – YIL

DOCUMENT NO. / MONTH – YEAR : İM – 01/11/03

İMALATÇI

MANUFACTURER : İMAK REDÜKTÖR VARYATÖR SAN ve TİC. A.Ş.
DEMİRKAPI KERESTECİLER SİT. RIZA UZUN SOK. NO:21
TOPÇULAR – İSTANBUL – TÜRKİYE

ÜRÜN TANITIMI : HELİSEL ve SONSUZ DİŞLİLİ REDÜKTÖRLER VARYATÖRLER

PRODUCT DESIGNATION : HELICAL and WORM GEARED UNITS VARIABLE SPEED DRIVES

TANIMLANAN ÜRÜNLERİN AŞAĞIDAKİ AVRUPA NORMLARININ TALİMATLARINA UYGUNDUR.
THE DESIGNATED PRODUCTS CONFIRM TO THE PROVISIONS OF THE FOLLOWING EUROPEAN
DIRECTIVES

SAYI / NUMBER : YAYIN TARİHİ :

EN 292 – 1

OCAK 1996

EN 292 – 2

OCAK 1996

UYGULANAN DİREKTİFLER / THE FOLLOWING DIRECTIVES

98/37/AT MAKİNE EMNİYET DİREKTİFİ
98/37/EEC MACHINERY DIRECTIVE

BU TALİMATLARA UYGUNLUKLA İLGİLİ BİLGİLER UYGUNLUK DOSYASINDA BELİRTİLMİŞTİR.
FOR FURTHER INFORMATION ABOUT COMPLIANCE WITH THESE DIRECTIVES SEE TECHNICAL
FILES

CE İŞARETİ UYGULAMA SIRASI / AFFIXING OF THE CE MARKING : 01

TANZİM EDEN / ISSUER : MEHMET FATİH ÖZDEMİR

YER – TARİH / PLACE – DATE : İSTANBUL 03.12.03

YETKİLİ İMZA – LEGALLY BINDING SIGNATURE

BU BEYAN, BELİRTİLEN TALİMATLARA UYGUNLUĞU, BELGELER, ÖZELLİKLER İLE İLGİLİ
GARANTİ HAKKI İÇERMEZ. ÜRÜN İLE BİRLİKTE VERİLEN TÜM GÜVENLİK UYARILARI, MONTAJ
VE İŞLETİM TALİMATLARINA UYULMASI GEREKİR. BU BEYAN, DİŞLİ ÜNİTESİ İÇİN GEÇERLİDİR.
MOTORU KAPSAMAZ.

THIS DECLARATION CERTIFIES COMPLIANCE WITH THE INDICATED DIRECTIVES BUT IMPLIENCE
NO WARRANTY OF PROPERTIES ALL SAFETY INSTRUCTIONS SHOWN ON DOCUMENTATION AND
MOUNTING INSTRUCTIONS ETC. SHALL COSERVED. THIS DECLARATION IS VALID ONLY FOR THE
GEAR UNIT PARTS AND DOES NOT COVER THE MOTOR.

KAYIT NO : 113199

