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maintenance manual**
安装维护手册

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1. Supply Conditions

The gear box are supplied as follows:

- Arranged for installation in the assembly position stated when the order was placed.
- Painted externally with a red water-base anti-oxidizing undercoat, unless provided for otherwise by contractual arrangement. This protective coating is suitable for normal industrial environments, even outdoors, and allows further finishing coats of synthetic paint to be applied.
- The external machined parts of the gear box, such as outside of the shafts, the resting surfaces, centering units and likewise the internal kinematic mechanisms, require protecting with anti-oxidizing oil. Suitably packed and dispatched, as required, in crates or on pallets.

2. Storage Conditions

For correct storage of the units, the following steps must be taken:

- For storage for over 2 months, protect the coupling surfaces, such as the flanges, shafts and joints, with a very thin layer of grease and/or protective anticorrosion fluids.
- Store in a dry place with temperatures of between -5°C and +30°C.
- Always place wooden planks or a platform made of other materials between the unit and the floor to prevent direct contact.
- Check the internal gears manually regularly by rotating the input shaft.

If the units are fitted with negative lamellar brakes, release the brake with a hydraulic pump or similar.

供货状况

减速机按照以下条件供货：

按订单指示安装位进行组装。

除非合同指定，减速机非加工面涂红色防氧化底漆。此保护层适合一般工业环境（即使在室外），并可进一步完成表面合成漆。

减速机的易生锈部分，例如轴的外层，静止的表面，中心部位和内部运行的机械装置都需要涂上防氧化保护油。按照要求，应使用木板箱，托盘等合适的包装及运送工具。

储存条件

为保证正确存放，须按照以下步骤：

放置2个月以上的，需在接合处的表面如法兰、轴和联轴器涂上一层很薄的防腐蚀的保护油脂。

存放在温度在零下5摄氏度至零上30摄氏度之间的干燥的房间内。

为了防止设备与地面的直接接触，需在它们之间放置木板或者用其他材料做的平台之类的。

用手有规律的旋转输入轴来检查内部的齿轮。

如果设备安装了静态制动器，使用液压油泵之前必须打开制动器。

- Before starting up the unit, we recommend you replace the rotary seal packing.
- In the event of storage lasting over 6 months, the efficiency of the rotary seals can no longer be guaranteed.

3. Installation

The Installation of the gear box must be carried out carefully and professionally, by suitable trained and technically skilled personnel.

All the Installation operations must be performed to ensure maximum safety levels are guaranteed for both workers and third parties and that the gear box operates correctly and safely.

- It is strictly forbidden to tamper with the gear box and any of the accessories fitted during production.
- When any lifting and handing maneuvers are carried out, care must be taken to ensure the end of the shaft does not hit anything. The relative hoisting straps and/or eyebolts must be used, suitably arranged, and with hoisting means whose capacity is sufficient for the job.
- It is strictly forbidden to carry out welding work on the gear box without suitable guards.
- Any Installation work or servicing must be carried out with the gear box stationary, therefore it is recommended that you ensure the gear box cannot be switched on accidentally.
- In the event of connections involving the use of rotary parts such as shafts, joint or pulleys with belts, suitable accident prevention gear must be provided.

在设备运行前，我们建议撕掉回转轴封的包装。

在存放时间达6个月以上时，回转轴封的功效将不再被保证。

安装

减速机的安装必须由经过培训的合适的技术人员仔细、专业地完成。

所有的安装工作都必须能在保证工人及他人最大安全及减速机能安全工作前提下正确地进行。

不允许改动减速机及附件。

当吊起时，注意轴的末端不要碰到任何东西。必须使用能够承受足够重量的吊绳及吊环螺栓。

严禁在没有保护措施的情况下在减速机上进行焊接。

所有的安装和维修工作都要在减速机静止的情况下进行，并建议你保证减速机不会有突然的启动。

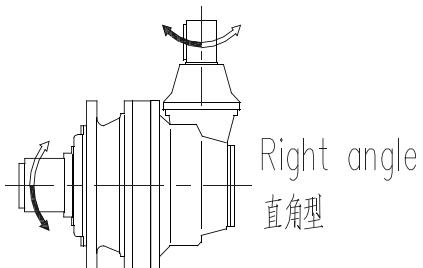
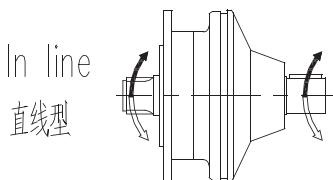
在有旋转部分如轴、接头或皮带轮的联接中，一定要有事故防范措施。

4. Rotation Direction

When making the connection, check the direction of the shafts depending on the input attached and using the figures below for reference.

旋转方向

当进行连接时，检查输入输出轴的旋向以及对照以下的图形作为参考。



5. Identification Plate

1. Product description
2. Serial number (year, batch number)
3. Product code

铭牌

- 产品规格
序列号（年，批次号）
产品编码

6. Flanged Design

SIZE:

Machine, on the unit or plant on which it will be installed, the coupling counter flanges. The surfaces where the gear box will be coupled must be flat and worked with machine tool.

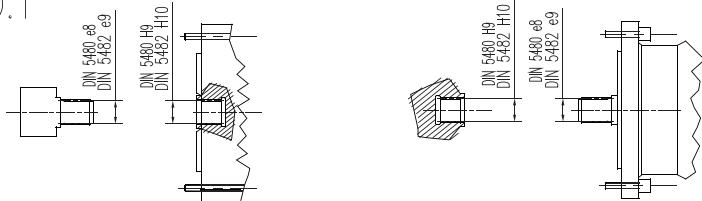
Connect the output shaft to the mechanism to be controlled following the instructions given in the draws below (NO.1), (NO.2) and (NO.3).

法兰的设计

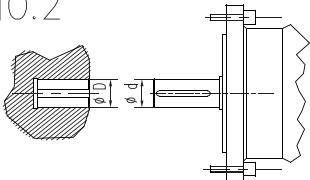
规格尺寸：
减速机连接处的表面必须是平整的并要用机床加工过的。

按照下面的图示指导来把输出轴连接到机械上。

NO.1

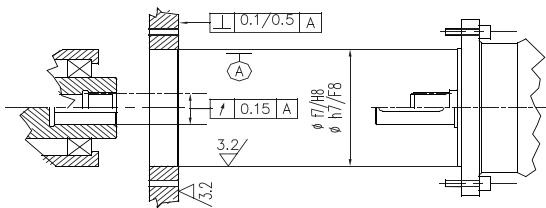


NO.2



Recommended tolerances / 推荐公差			
Loose coupling / 松配联接		Coupling with interference / 紧配联接	
Solid shaft/实心轴	Hollow shaft/空心轴	Solid shaft/实心轴	Hollow shaft/空心轴
φd h7	φD G7	φd h7	φD K7
φd h7	φD F7	φd h7	φD M7
		φd h7	φD N7

NO.3



For Transmission torques greater than or equal to those indicated in the table and with frequent motion inversions, use screws with minimum resistance class 10.9.

为了使传送的扭矩大于等于经常发生的运转，要使用最小抗扭等级10.9的螺栓。

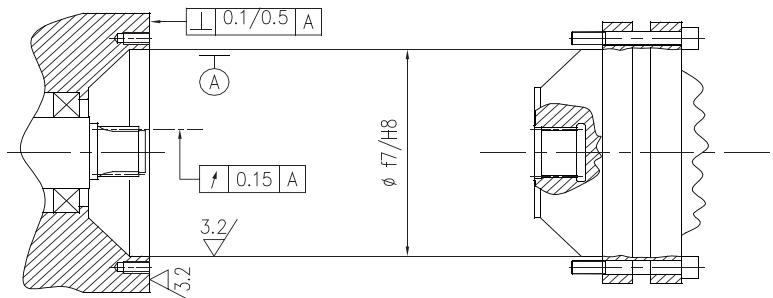
7. Female Grooved Shaft Design

Make sure the gear box and the driven shaft are aligned and that the latter is not exposed to bending during operation. See draw (NO.4).

齿轮箱安装

在确定减速机和驱动轴在一直线上以及轴在运转时不会露出来导致受弯扭。

N0.4



For Transmission torques greater than or equal to those indicated in the table and with frequent motion inversions, use screws with minimum resistance class 10.9.

为了使传送的扭矩大于等于经常运转发生的，要使用最小抗扭等级10.9的螺栓。

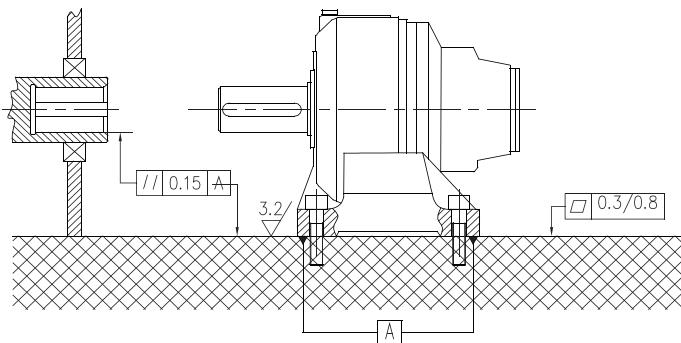
8. Design With Feet

These gear box must be fastened on a suitably sturdy base work with a machine tool and with a maximum planarity error of 0.3mm/0.8mm. See draw (NO.5).

地脚安装设计

这些减速机必须把底部紧紧的固定在一个最大平面度误差在0.3毫米到0.8毫米之间的加工面上。

N0.5



Caution

To prevent abnormal loads on the gear box bearings if the motor is coupled directly, it must be integral to and therefore pendulum with the gear box.

Mounting Positi

	Horizontal position / 水平安装		vertical position / 垂直安装	
	009-100	130-600	009-100	130-600
S _P				
	B3	B3	V5	V5
IN LINE				
	B3	B3	V6	V6
H				
	B3	B3	V5	V5
RIGHT ANGLE				
	V5B	B3D	V6	V6B
Drain plug 放油螺塞		Oil level plug 油标	Breather and filling plug 透气塞	

注意

在把马达直接连接在减速机上时为了防止产生不规则的载荷，连接必须是完整的，因此能够和减速机一起摆动。

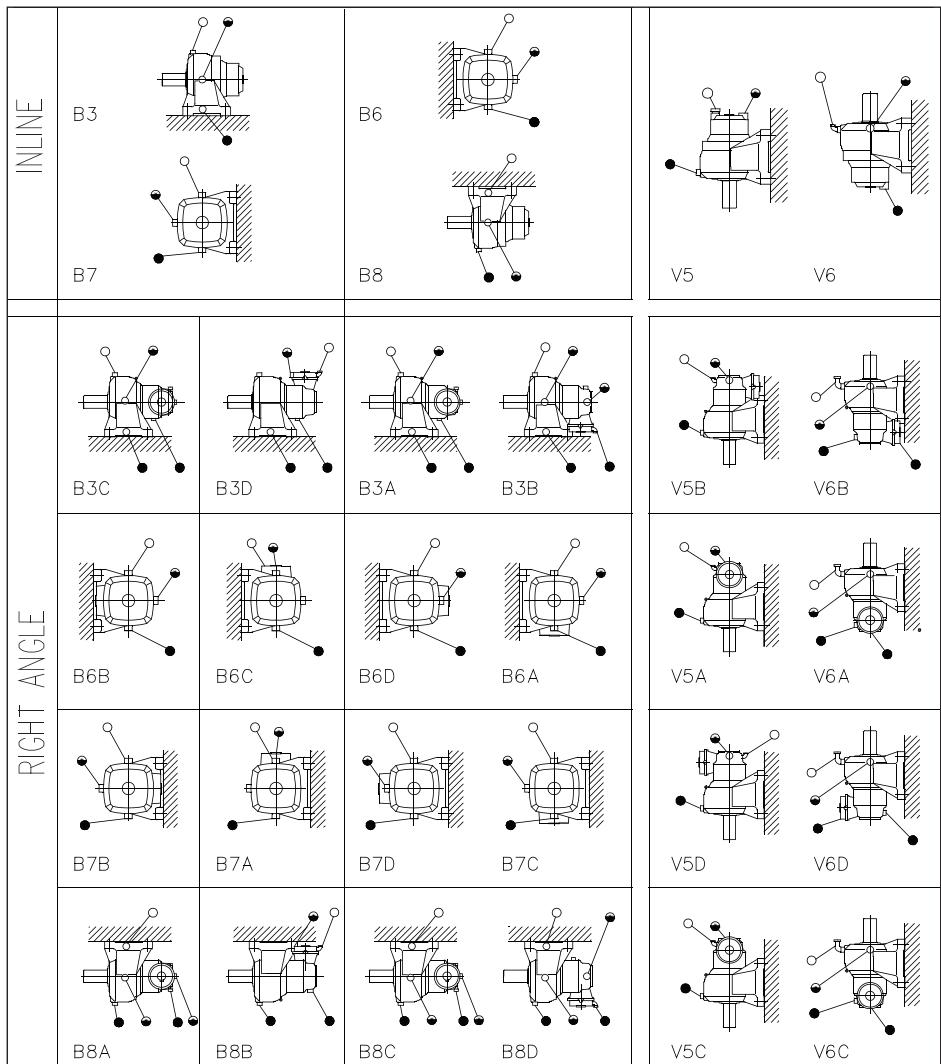
安装位置

Horizontal Position

水平安装

Vertical Position

垂直安装



9. Connections

Fasten the input and output mechanisms connecting to the gear box without striking them with hammers or suchlike.

Use the service screws and the threaded holes on the shafts for inserting the mechanisms.

Before fitting the connecting mechanisms, remember to clean the shafts to remove any traces of grease and/or protective treatments.

10. Connections To The Motor

Hydraulic motor

Remove the protective cap.

Oil seal is guaranteed by the ring fitted on the joint on the motor, you will simply need to apply a thin layer of oil to the driving shaft.

E-Motor Connection

If the motor in question is a particularly high power motor (ME-225 and above), use B3-B5 motors with suitable supports.

N.B: The motors must always be perfectly aligned whether the motor and the gear box shaft are coupled with a joint or (and especially) if they are coupled directly.

Incorrect positioning can cause damage to the bearings on both the motor and the motor set-up.

连接

先把输入输出机构轻轻的连接到减速机上然后用锤子之类的工具紧固。

使用螺丝把轴嵌入到机构中。

在安装连接装置之前，记住要把轴上的保护用油脂等去除干净。

与马达的连接

液压马达

移去保护层。

环形的油封已经装在马达的接口处，只需要在传动轴上涂上薄薄的一层润滑油。

电机连接

如果这种马达是大功率马达(ME-225或者以上)，要使用有支撑的B3-B5型的马达。

不论马达和减速机的轴是用联轴器连接或是直接连接，马达必须扶准对中。

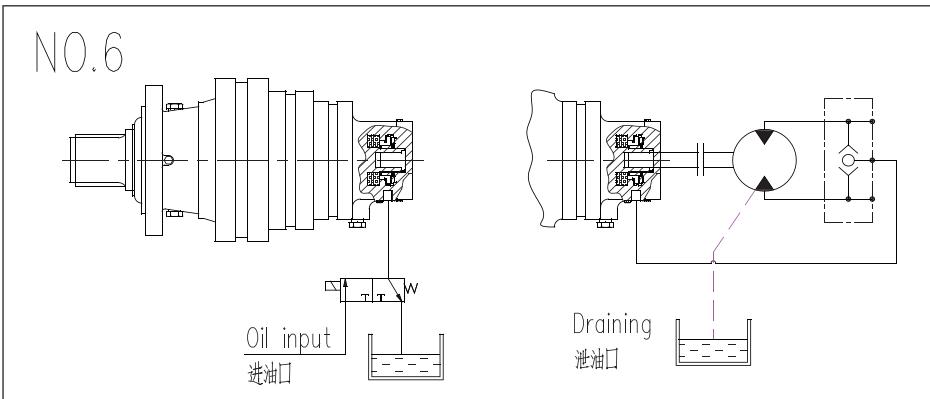
不正确的定位可能损坏马达和接盘上的轴承。

11. Connection To The Brake

For gear box arranged for hydraulic motors and complete with brakes, when installing, connect to the hydraulic control hole on the brake body with a suitable hydraulic circuit pipe. See draw (NO.6).

与制动器的连接

与减速机配套的液压马达和制动器，在安装时，使用一个合适的油管连接在制动器的液压控制孔上。(见图NO.6)



12. Gear Box Installation

With an electric motor

If the complete gearmotor set is supplied, follow the instructions given previously for its installation. The electrical connection types are stamped inside the terminal cover.

With a hydraulic motor

In addition to the regulations concerning the installation of the gear box, it is recommended that you follow the rules below for the installation of the hydraulic motor.

a) Connection to the hydraulic circuit

The motors can be connected in either open or closed loop circuits.

减速机的安装

和电机的安装

如果已经提供了整套的齿轮马达，就按照先前的说明来安装。电气接线的说明附在接线盒中。

和液压马达的安装

除了减速机的安装规则之外，你还可以根据以下规则来安装液压马达。

与油路的连接

马达可以连接在开环或者闭环油路里。

If it is an open loop circuit, the solenoid valve or control distributor can be of either a closed or open center type.

The branch of the circuit corresponding to the hydraulic motor delivery side or the flange side of the motor must always have a maximum pressure valve fitted calibrated to a valve not exceeding the valve Pint (internal pressure) admitted for the hydraulic motor.

b) Connection to the drainage hole

For counter-pressure >15 bar with continuous operation and >30 bar with intermittent operation, the drain must always be connected.

c) Hydraulic oil type

We recommend the use of mineral hydraulic oil with viscosity level ISO VG 46 (46 Cst at 40°C)

d) Filtering

To guarantee reliable motor operation and a long working life for the unit, it is extremely important that the hydraulic circuit is equipped with a filtering capacity which can ensure a degree of oil cleanliness that complies with the following standards:

Grade 9 NAS 1683

Grade 6 SAE

Grade 18/15 SO DIS 4406

如果是一个开环，电磁阀或者控制器可以是闭路式也可以是开路式。

液压马达出油管路或法兰面必须安装有减压阀以保证内部压力不超出允许值。

与泄油口的连接

当连续工作且背压大于15公斤或间歇大于30公斤的时候，一定要接泄油口。

液压油的类型

我们推荐使用粘度等级为ISO VG 46 (46 Cst at 40°C)的矿物液压油。

过滤

为了保证设备上的马达运作的可靠性以及长时间的工作寿命，液压回路很有必要装备按照以下标准的，能够保证油脂清洁程度的过滤器：

9级 NAS 1683

6级 SAE

18/15级 SO DIS 4406

润滑

所有KPM的减速机供货时都不带润滑油。

在使用机器前，必须保证设备已经加够量合适的润滑油。

13. Lubrification

All KPM gear box are supplied without lubrication.

The user is required to ensure the units are filled with the correct lubricants before putting the machine to use.

14. Essential Oil Features

The primary parameters to take into account when choosing the oil type are listed below:

- viscosity in normal operating conditions
- additives

The same oil must lubricate both the bearings and the gear and all these components are housed within the same body, in different operating conditions.

14.1 Viscosity

The reference temperature for nominal viscosity is 40°C, but viscosity decreases as the temperature increases.

The oil viscosity must be chosen to suit the room temperature and the gear box's real operating temperature.

Choose a nominal viscosity from the table below:

油脂的特征

当选择以下列出的油脂类型时需要考虑的主要参数：

正常工作状态时的粘度
添加剂

在不同的运行情况下，同一油脂必须能够润滑同一设备内的轴承和齿轮。

粘度

在正常粘度时的参考温度为40°C，但是随着温度的增高粘度会随之下降。

选择油脂的粘度等级时必须考虑到适合室温和减速机真正的工作温度。

从以下的表格中选择一个合适的粘度：

SAE J 306 81	VG ISO 3448	OPERATION TEMPERATURE / 工作温度												
		AMBIENT TEMPERTURE / 环境温度												
		-20°	-10°	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°	100°
80W	68													
85W	150													
90W	220													

Particular attention is needed for heavily loaded output strokes with very low speeds (<1 rpm).

当低转速高负载输出时需特别注意。

In this case, you must always use high viscosity oils with a high proportion of EP (Extreme Pressure) additives.

须总是使用拥有高比例EP（超高压）添加剂的高粘度润滑油。

14.2 Oil types

The oils available generally belong to two large families.

a) Mineral oils

b) Synthetic oils (poly-alpha-olefins)

Choosing the right oil depends mostly on use conditions. The gear box which are not exposed to particularly heavy loads and are used in discontinuous work cycles, without significant thermal ranges can definitely be lubricated with mineral oils.

If they are put to more heavy-duty use, usually with greater loads and continuous work cycles, which will inevitably mean higher temperatures, then synthetic PAO (poly-alpha olefins) lubricants are recommended.

In addition to those already mentioned, there are also hydraulic oils and those for the food industry.

The former are used for controlling negative brakes, the latter are employed specifically in the food industry as they are not hazardous to the health.

油脂类型

常用的油脂有两大类：

矿物油

合成油 (PAO)

主要根据使用条件来选择正确的油脂当不承受高负荷的减速机在间歇性工作中使用，不产生大量热量的情况下，可以用矿物油润滑。

如果在更恶劣的情况下使用，比如说更高的负荷和连续的工作，会不可避免的产生更高温度时，更适合使用合成油。

除了以上提及的之外，还有液压油及食品业用油。

液压油用于控制制动器，食品业用油用于食品工业以避免危害健康。

Table of lubricant oils for general use

一般用途润滑油一览表

Manufacturer 油的制造商	Mineral oils 矿物油			Poly-Alpha-Olefin synthetic oils(PAO) 聚烯类合成油			Polyglycol synthetic oils(PG) 聚乙二醇合成油		
	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
ADDINOL	Transmission Oil CLP 150	Transmission Oil CLP 220	Transmission Oil CLP 320	Eco Gear 150 S	Eco Gear 220 S	Eco Gear 320 S	Luboil RS 150	Luboil RS 220	-
AGIP	Blasia 150	Blasia 220	Blasia 320	-	Blasia SX 220	Blasia SX 320	Blasia S 150	Blasia S 220	Blasia S 320
ARAL	Degol BG 150	Degol BG 220	Degol BG 320	Degol PAS 150	Degol PAS 220	Degol PAS 320	Degol GS 150	Degol GS 220	Degol GS 320
BP	Energol GR-XP 150	Energol GR-XP 220	Energol GR-XP 320	Enersyn EPX 150	Enersyn EPX 220	Enersyn EPX 320	Enersyn SG 150	Enersyn SG 220	Enersyn 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
CEPSA	Engranajes HP 150	Engranajes HP 220	Engranajes HP 320	Engranajes HPX 150	Engranajes HPX 220	Engranajes HPX 320	Engranajes HPS 150	Engranajes HPS 220	Engranajes HPS 320
CHEVRON	Ultra Gear 150	Ultra Gear 220	Ultra Gear 320	Tegra Synthetic Gear 150	Tegra Synthetic Gear 220	Tegra Synthetic Gear 320	Hipersyn 150	Hipersyn 220	Hipersyn 320

Manufacturer 油的制造商	Mineral oils 矿物油			Poly-Alpha-Olefin synthetic oils(PAO) 聚烯烃合成油			Polyglycol synthetic oils(PG) 聚乙二醇合成油		
	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
DEA	Falcon 150	Falcon 220	Falcon 320	Intor 150	Intor 220	Intor 320	Polydea 150	Polydea 220	Polydea 320
ERG	Roxin S EP 150	Roxin S EP 220	Roxin S EP 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
FUCHS	Renolin CKC 150	Renolin CKC 220	Renolin CKC 320	Renolin Unisyn CKC 150	Renolin Unisyn CKC 220	Renolin Unisyn CKC 320	Renolin PG 150	Renolin PG 220	Renolin PG 320
LUBRITECH	Gearmaster CLP 150	Gearmaster CLP 220	Gearmaster CLP 320	Gearmaster SYN 150	Gearmaster SYN 220	Gearmaster SYN 320	Gearmaster PGP 150	Gearmaster PGP 220	Gearmaster PGP 320
KLÜBER	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
LUBMARINE	Epona Z 150	Epona Z 220	Epona Z 320	-	Epona SA 220	Epona SA 320	-	-	-
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 HE320
MOLIKOTE	L-0115	L-0122	L-0132	L-1115	L-1122	L-1132	-	-	-
NILS	Ripress EP 150	Ripress EP 220	Ripress EP 320	Ripress Synt Food 150	Ripress Synt Food 220	Ripress Synt Food 320	Ripress Synt 150	Ripress Synt 220	Ripress Synt 320
OMV	Gear HST 150	Gear HST 220	Gear HST 320	-	Gear SHG 220	Gear SHG 320	Gear PG 150	Gear PG 220	Gear PG 320
OPTIMOL	Optigear BM 150	Optigear BM 220	Optigear BM 320	Optigear Synth- etic A 150	Optigear Synth- etic A 220	Optigear Synth- etic A 320	Optiflex A 150	Optiflex A 220	Optiflex A 320
PAKELO	Erolube EP-C ISO 150	Erolube EP-C ISO 220	Erolube EP-C ISO 320	Gearsint EP ISO 150	Gearsint EP ISO 220	Gearsint EP ISO 320	Allsint EP-C ISO 150	Allsint EP-C ISO 220	Allsint EP-C ISO 320
PENNZOIL	Super Maxol EP 150	Super Maxol EP 220	Super Maxol EP 320	-	-	-	-	-	-
Q8	Goya 150	Goya 220	Goya 320	El Greco 150	El Greco 220	El Greco 320	Gade 150	Gade 220	Gade 320
POLOIL	EP/150	EP/220	EP/320	-	-	-	Sincat 150	Sincat 220	Sincat 320
ROYAL	-	-	-	Synergy 150	Synergy 220	Synergy 320	-	-	-
PURPLESHELL	Ornala 150	Ornala 220	Ornala 320	Ornala HD 150	Ornala HD 220	Ornala HD 320	Tivela S 150	Tivela S 220	Tivela S 320
SINCLAIR	Warrior EP/NL 150	Warrior EP/NL 220	Warrior EP/NL 320	-	-	-	-	-	-
SUNOCO	Sun EP 150	Sun EP 220	Sun EP 320	Duragear 150	Duragear 220	Duragear 320	-	-	-
TAMOIL	Carter EP Lubricant 150	Carter EP Lubricant 220	Carter EP Lubricant 320	-	-	-	-	-	-
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	800/1580	800/220	800/320

**Table of lubricants suitable for food use
(approved according to USDA-H1 and
NSF-H1 specifications)**

**食品用润滑油一览表
(经由USDA-H1和NSF-H1标
准认证)**

Manufacturer 油的制造商	Hydraulic Oils 液压油			Gear Oils 齿轮油		
	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 32	-	Rocol Foodlube Hi-Torque 320
ARAL	Eural Hyd 32	Eural Hyd 46	Eural Hyd 68	Eural Gear 150	Eural Gear 220	-
BEL-RAY	No-Tox HD Hyd Oil 32	No-Tox HD Hyd Oil 46	No-Tox HD Hyd Oil 68	No-Tox Syn Gear Oil 150	No-Tox Syn Gear Oil 220	No-Tox Syn Gear Oil 320
BP	Enerpar M 32	Enerpar M 46	Enerpar M 68	-	-	-
CHEVRON	Lubricating Oil FM 32	Lubricating Oil FM 46	Lubricating Oil FM 68	-	Lubricating Oil FM 220	-
ESSO	Nuto FG 32	Nuto FG 46	Nuto FG 68	-	Gear Oil FM 220	-
KEYSTONE	Nevastane SL 32	Nevastane SL 46	Nevastane SL 68	Nevastane EP 150	Nevastane EP 220	Nevastane EP 320
KLÜBER	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
NILS	Mizar 32	Mizar 46	Mizar 68	Ripress Synt Food 150	Ripress Synt Food 220	Ripress Synt Food 320
OPTIMOL	Optileb HY 32	Optileb HY 46	Optileb HY 68	Optileb GT 150	Optileb GT 220	Optileb GT 320
PAKELO	Non-Tox Oil Hyd- raulic ISO 32	Non-Tox Oil Hyd- raulic ISO 46	Non-Tox Oil Hyd- raulic ISO 68	Non-Tox Oil Gear EP ISO 150	Non-Tox Oil Gear EP ISO 220	Non-Tox Oil Gear EP ISO 320
ROYAL PURPLE	Poly-Guard FDA 32	Poly-Guard FDA 46	Poly-Guard FDA 68	Poly-Guard FDA 150	Poly-Guard FDA 220	Poly-Guard FDA 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	-
TRIBOL	Food Proof 1840/32	Food Proof 1840/46	Food Proof 1840/68	-	Food Proof 1810/220	Food Proof 1810/320

15. Refilling

The gear box are supplied without lubricating oil.

All the gear box are equipped with oil filling/drainage and level inspection caps.

To fill the oil tank, the gear box must be in the exact operating position. Unscrew the oil filler cap and fill the tank until the oil reaches the right level. This level depends on whether the motor is fitted horizontally or vertically.

To drain out the oil, unscrew the drainage cap and allow the oil to flow out.

补充说明

供货时减速机不带润滑油。

所有的减速机都装有进油口，泄油口和油位观察油镜。

减速机必须处在工作位置时才能加油。拧开加油口螺丝，注入润滑油直到达到正确的油位面。这个油位面取决于马达安装水平位置还是垂直位置。

放油时，拧开泄油口螺丝使油流出。

To facilitate this operation, the oil should be still warm and the cap located on top of the gear box removed to allow the air to circulate better.

Brake lubrication

Gear box oil does not provide brake lubrication, so it must be injected (about 0.08L) viscosity index of ISO VG32 ISOVG32 Mineral oil, or other suitable lubricating oil.

Oil Quantities

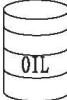
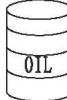
L	B5	V1	V3	B6	B7	B8	B3	V5	V6
									
KL1015	0,8	1,6	1,6	0,7	0,7	0,8	0,5	1,0	1,0
KL2015	1,0	2,0	2,0	0,9	0,9	1,0	0,7	1,4	1,4
KL3015	1,2	2,4	2,4	1,1	1,1	1,2	0,9	1,8	1,8
KL4015	1,4	2,8	2,8	1,3	1,3	1,4	1,1	2,2	2,2
KL1025	1,5	3,0	3,0	1,4	1,4	1,5	1,0	2,0	2,0
KL2025	1,8	3,6	3,6	1,7	1,7	1,8	1,3	2,6	2,6
KL3025	2,0	4,0	4,0	1,9	1,9	2,0	1,5	3,0	3,0
KL4025	2,2	4,4	4,4	2,1	2,1	2,2	1,7	3,4	3,4
KL1050	1,6	3,2	3,2	1,5	1,5	1,6	1,1	2,2	2,2
KL2050	2,0	4,0	4,0	1,9	1,9	2,0	1,5	3,0	3,0
KL3050	2,3	4,6	4,6	2,2	2,2	2,3	1,8	3,6	3,6
KL4050	2,5	5,0	5,0	2,4	2,4	2,5	2,0	4,0	4,0
KL1070	2,4	4,8	4,8	2,3	2,3	2,4	1,6	3,2	3,2
KL2070	2,8	5,6	5,6	2,7	2,7	2,8	2,0	4,0	4,0
KL3070	3,1	6,2	6,2	3,0	3,0	3,1	2,3	4,6	4,6
KL4070	3,3	6,6	6,6	3,2	3,2	3,3	2,5	5,0	5,0
KL1100	—	—	—	—	—	—	2,4	4,8	4,8
KL2100	—	—	—	—	—	—	3,1	6,2	6,2
KL3100	—	—	—	—	—	—	3,5	7,0	7,0
KL4100	—	—	—	—	—	—	3,8	7,6	7,6
KL1160	—	—	—	—	—	—	2,6	5,2	5,2
KL2160	—	—	—	—	—	—	3,3	6,6	6,6
KL3160	—	—	—	—	—	—	3,7	7,4	7,4
KL4160	—	—	—	—	—	—	4,0	8,0	8,0
KL1260	—	—	—	—	—	—	3,7	7,4	7,4
KL2260	—	—	—	—	—	—	4,6	9,2	9,2
KL3260	—	—	—	—	—	—	5,0	10,0	10,0
KL4260	—	—	—	—	—	—	5,3	10,6	10,6

为便于操作，须乘油仍然温热时，打开减速机顶部的通气帽以使空气流通。

制动器润滑

齿轮箱油液不提供制动器的润滑，因此必，须注入(大约0.08升)粘度指标为的矿物油，或者换用其它合适的润滑油。

油量

L	B3	V5	V6	L	B3	V5	V6
							
KL1330	4.0	8.0	8.0	KL12500	30.0	60.0	60.0
KL2330	5.5	11.0	11.0	KL22500	32.4	64.8	64.8
KL3330	6.0	12.0	12.0	KL32500	33.8	67.6	67.6
KL4330	6.3	12.6	12.6	KL42500	34.2	68.4	68.4
KL1400	7.0	12.0	12.0	KL13500	42.5	85.0	85.0
KL2400	9.0	14.0	14.0	KL23500	46.5	93.0	93.0
KL3400	10.0	15.0	15.0	KL33500	47.9	95.8	95.8
KL4400	11.0	16.0	16.0	KL43500	48.7	97.4	97.4
KL1500	5.2	10.4	10.4				
KL2500	6.5	13.0	13.0				
KL3500	7.1	14.2	14.2				
KL4500	7.5	15.0	15.0				
KL1600	7.2	14.4	14.4				
KL2600	8.5	17.0	17.0				
KL3600	9.7	19.4	19.4				
KL4600	10.1	20.2	20.2				
KL1850	—	—	—				
KL2850	17.0	25.0	25.0				
KL3850	19.0	27.0	27.0				
KL4850	20.0	28.0	28.0				
KL11050	8.7	17.4	17.4				
KL21050	10.0	20.0	20.0				
KL31050	11.2	22.4	22.4				
KL41050	11.5	23.0	23.0				
KL11350	15.0	30.0	30.0				
KL21350	16.4	32.8	32.8				
KL31350	17.6	35.2	35.2				
KL41350	18.1	36.2	36.2				
KL11800	21.0	42.0	42.0				
KL21800	23.4	46.8	46.8				
KL31800	24.8	49.6	49.6				
KL41800	25.2	50.4	50.4				
KL12050	21.0	42.0	42.0				
KL22050	23.4	46.8	46.8				
KL32050	24.8	49.6	49.6				
KL42050	25.2	50.4	50.4				

16. Installation Regulations

Before installing the gear box, check that it is the design required for the position in which it will be fitted.

安装规则

在安装减速机之前，必须对将安装的部位详细检查。

17. Warranty

1.The Supplier guarantees the conformity of the products supplied, intending thereby that said products correspond, in terms of quantity and performance, with the stipulations of the contract.

2.The warranty has a term of six months, which shall be valid from the delivery of the products and, for replacement products or parts, from the day of their replacement.

3.Within this period, the Supplier, upon receiving written notification from the Customer of any faults and/or flaws found, which shall be issued within eight days of said defects faults and/or flaws being found, undertakes, at its discretion, to either repair or replace the products or the parts thereof which are effectively found to be faulty or flawed free of charge.

4.As a rule, the replacements or repairs are effected ex works: the carriage costs and risks for the faulty products are borne by the Customer.

However, if the Supplier, on the basis of its unquestionable judgement, agrees with the Customer that it is more appropriate for the repair or replacement work to be carried out on the Customer's premises, the latter shall bear the cost of transport and lodging for the technical staff required to carry out the work quickly and safely.

注意

供应商保证提供与合同相一致的产品，以及数量和性能。

从产品运出开始，或从产品或配件的替换之日起开始有效的保修期为6个月。

在这段时间里，客户在发现产品的任何故障和缺陷的8天内书面通知供应商的，供应商在肯定是否是质量问题后应该免费的维修或者更换问题部件。

作为常规，配件的替换或维修在厂外进行时，运费和产品可能被损坏的风险将由客户承担。

然而，如果供应商基于故障原因的肯定判断同意客户在客户的地点进行维修或者配件的更换，后者需要承担维修技术人员的交通和住宿费用以便能更快速和安全的进行维修工作。

5.The warranty is forfeited if the products are fitted incorrectly or misused, if they have not undergone sufficient servicing, or have been modified, repaired or disassembled, even only partially, without the Supplier's permission, or outside the Supplier's workshop or authorized centers.

如果出现以下情况将视为自动放弃保修资格：产品被不正确的安装和使用，没有及时的维修，在没有供应商或者其他权威认证机构许可的情况下进行改动，维修或分解。

6.The labour costs for work not under warranty shall be borne by the Customer. Delays shall not result in the Customer's right to compensation for damages nor an extension of the warranty.

客户需要承担不在保修范围中的人工成本。延期不会导致客户有权索赔也不导致保修期的延长。

None of the possibilities indicated in this article shall entitle the Customer to seek termination of the contract or compensation for damages.

客户不能因本书提到的情况提出终止合同或要求赔偿损失。

The supplier's prompt intervention under warranty depends on the Customer's payment situation.

供应商根据客户的付款情况来决定是否进行及时的保修。

The Customer shall not hold any entitlements for the term during which the system is inactive.

在条款不在执行时客户不享有任何权利。

The parts replaced shall remain the property of the Supplier and shall be sent back by the Customer free port.

被替换下的部件归供应商所有，客户需将之送回。

All carriage costs, risks and dangers incurred for the products under warranty shall be borne by the Customer.

在保修期中所有可能导致产品发生费用，风险及危险的将由客户承担。

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Product Line Gear Box

齿轮箱系列产品

Gear Box
齿轮减速机



Helical gear box
平行轴减速机

CAVEX® Worm Gear Box
CAVEX® 蜗轮蜗杆减速机



Single worm gear box
单级蜗轮蜗杆减速机

Planetary Gear Box
行星减速机



Coaxial planetary gear box
直线型行星减速机



Bevel-helical gear box
直交轴减速机



Double worm gear box
双级蜗轮蜗杆减速机



Orthogonal planetary gear box
直角型行星减速机



Right angle gear box
圆锥齿轮减速机



Winches
卷扬行星减速机



Gear motor
齿轮马达

Torque range 扭矩范围
600 Nm - 1 500 000 Nm

Torque range 扭矩范围
600 Nm - 500 000 Nm

Torque range 扭矩范围
600 Nm - 1 500 000 Nm

Product Series Coupling 联轴器系列产品

Highly Flexible Coupling 高弹性联轴器



Torsionally Rubber Disc Couplings
齿式高弹联轴器

Flexible Coupling 弹性联轴器 (橡胶体)



Claw Couplings
爪型弹性联轴器

Rigid Coupling 刚性联轴器



Grid Couplings
蛇簧联轴器



Couplings with Cardan Shaft
盘式高弹联轴器



Torsionally Flexible Flywheel Couplings
飞轮爪型弹性联轴器



Torsion Stiff Metallic Couplings
膜片式联轴器



Shafts for Test Benches
双向高弹联接轴(测试台架用)



Titoni Couplings
梅花弹性联轴器



Gear Couplings
鼓型齿联轴器



Tyre Couplings
轮胎式高弹联轴器



Pin Couplings
弹性套柱销联轴器



Universal Joint Couplings
万向联轴器

Torque range 扭矩范围
15 Nm – 100 000 Nm

Torque range 扭矩范围
20 Nm – 1 000 000 Nm

Torque range 扭矩范围
50 Nm – 8 800 000 Nm

Process of Quick Diagnose on Side

减速箱现场快速诊断(体检)流程



HELP



快速反应24小时内到达现场



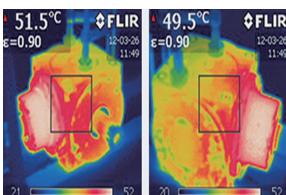
减速箱运行时的热图像检测



不用拆卸减速箱诊断过程中



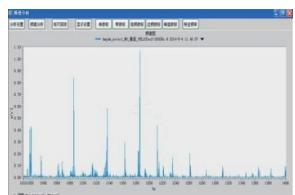
现场振动分析操作过程中



减速箱的热图像



带照片的检测文档



振动频谱分析报告



减速箱现场各项数据结果分析，提供
评估报告和维修建议

Reference 业绩参考

Mobile Equipment 可驱动设备:

Terex, 中铁建(CRCC), Liebherr, Zeppelin, 振华港机(ZMPC), 中联重科(ZOOLION), 江苏谷登, Vossloh, Komatsu(小松), Stiebel, 徐工(XCMG), Cummins(康明斯), 天业通联(TOLIAN), 土行孙, 恒天九五, 天津鼎盛, 地龙

Portable Equipment 可移动设备:

GE Jenbacher(通用电气), MWM, MTU, Caterpillar(卡特彼勒), Atlas Copco(阿特拉斯·柯普科), Sullair(寿力), GHH, Ingersoll Rand(英格索兰)

Industry Equipment 工业设备:

上海宝钢(Bao Steel), 大亚湾核电(DYW Nuclear), 武钢(Wuhan Steel), VAI (奥钢联), Howden, 鞍钢(ANSTEEL), 上海电力(Shanghai Electric), SMS(西玛格), 上海石化(SPC), 天华院, 金山石化, 江西瑞林, 安柴, 苏州协力, 江苏胜达, 江阴华硕, 中国二重(CNEG), 沈阳电力

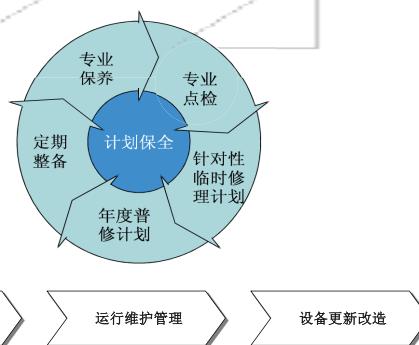
Marine 船舶设备:

ZF, Schottel, Lindenberg, Janssen, SDT, 江苏海泰船舶, 江苏博林, 江苏瑞风, 华西海工

Automotive 汽车行业设备:

AVL, Horiba, D2T, FEV, Daimler(奔驰汽车), VW(大众汽车), Hyundai(现代汽车), MAN, 东风汽车, 福田汽车, 一汽大众(FAW), 上汽集团

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