Model/型号:
Ex-factory date/出厂日期:
出厂编号:

CWT series gear box Operating Instruction
CWT 系列双螺杆传动箱使用说明书

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1 General notes 概述

1.1 Introduction 导言

These present operating instructions are limited to the COWELL-HT series gearbox. 本操作说明仅适用于COWELL-HT系列传动箱。

These operating instructions are intended to be read and fully adhered to by the persons responsible for operation, servicing and maintenance of the plant. 这些使用说明用来指导用户对我公司设备进行操作、维护和保养，操作者必须熟读并遵守本说明。

The complete operating instructions must be kept in the vicinity of the plant at all times. This assures that they can be quickly consulted whenever necessary. 为了保证在需要的时候能得到及时的参考，必须将本使用说明书置于设备的附近。

Reading these operating instructions carefully before starting up the plant is mandatory. COWELL MACHINERY shall not be liable for damage and malfunction resulting from non-observance of these operating instructions. 在启动设备之前必须仔细阅读这些使用说明，对不遵守本手册造成损害和故障，科威机械将不承担任何责任。



The operating instructions and the safety notes must be read and adhered to prior to starting up the plant.

在启动设备前必须熟读并遵守操作说明和安全事项。

1.2 Intended purpose 指定用途

The purpose is limited to the intended application specified in chapter 2.1. 用途只限于2.1节中指定的用途。

If the units are used outside the specified application range, COWELL MACHINERY shall not be liable for damage or malfunction, and the warranty shall be void. 如果此设备被用来加工指定范围之外的应用，科威机械将不负责因此造成的损伤或故障，并将取消担保。

1.3 Copyright 版权

For certain reasons causing the difference from this documents, our company will not inform and explain seperately. All rights are reserved by COWELL MACHINERY. 由于某种原因造成实际与本说明书不符的情况，我公司不另行通知和说明。本资料的最终解释权归科威机械所有。



Modifications to the units after start-up which would result in deviation from the data sheet are impermissible. If such a modification should become necessary, it must be approved by COWELL MACHINERY beforehand.设备启动后，如果某些改动可能会造成背离参数表指定范围的情况，那这种改动是不允许的。如果这样的改动是必需的，须预先得到科威机械的批准。

2 Technical data 技术参数

About the technical data for a certain machine, please see attached data sheet.
关于某一设备的技术参数，请查看附加的参数表。

型号	中心距 (mm)	螺杆最高转速 (r/min)	电机功率 (kw)	单根螺杆扭矩 (N.m)	比扭矩 (T/A3)
CWT-20	18	600	5.5	17	5.0
CWT-25	22	600	11	57.3	5.4
CWT-35	30	600	18.5	141	5.2
CWT-40	34.5	600	30	229	5.6
CWT-52	43	600	55	420	5.3
CWT-65	52	500	90	825	5.9
		600	110	840	6.0
CWT-75	60	500	132	1210	5.6
		600	160	1222	5.7
TSB-85	68	500	500	200	1834
TSB-95	78	400	400	250	2865
		500	500	280	2567
TSB-135	110	400	400	650	7449

3 Plant description 设备描述

3.1 Gearbox 齿轮箱

具有减速和分配功能的齿轮箱，可以使电机的转速降低到芯轴所需要的转速，并把输出扭矩分配到两根输出轴上。联轴器安装在电机和齿轮箱主动轴之间。

Gearboxes having speed reduction and distribution functions can reduce the rotational speed of the motor to the desired rotational speed of the shaft, and can also distribute the output torque to the two output shafts. A coupling is installed between the motor and the gearbox drive shaft.

油润滑系统有两个作用：The oil lubrication system has two functions:

润滑轴承和齿轮

To lubricate the bearings and gears

通过油泵把恒温的油送到齿轮箱

To send oil at a constant temperature to the gearbox by means of an oil pump

油经过油冷却器和油过滤器被油泵抽到齿轮箱。

Oil passes through an oil cooler and oil filter and is pumped to the gearbox by an oil pump.

3.2 Gearbox lubrication cooling system 齿轮箱的油润滑系统

The gearbox lubrication cooling system is mainly consists of three parts: Oil pump, Heat exchanger and filter. About the cooling circuit please see lubrication system diagram (Fig. 6) 齿轮箱的油润滑系统主要由三个部分组成：油泵、热交换器和过滤器，请参照油润滑的原理图（图6）。

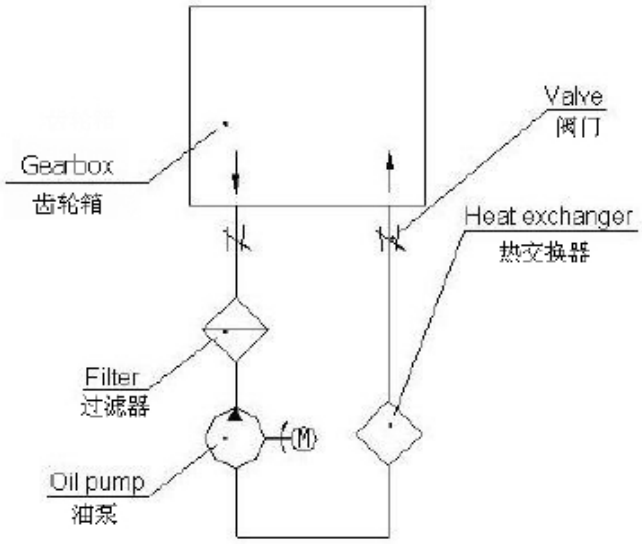


Fig. 6 : Lubrication system diagram 油润滑系统原理图

The forced oil lube system has two purposes:油润滑系统有两个目的：

- to lubricate the bearing and gears with oil, and 润滑齿轮和轴承
- to pump oil of a controlled temperature into the gearbox. 将恒温的油送入齿轮箱

The oil is pumped into the gearbox through the oil cooler and an oil filter by a pump. 油经过冷却器冷却，再经过过滤器过滤后被油泵抽入齿轮箱。

★Lubrication oil code: CKC220# industrial gear oil or 85W/90GL-4 medium-duty vehicle gear oil.润滑油系统牌号：CKC220＃工业齿轮油或85W/90GL-4中负荷车辆齿轮油。

3.3 Electrical equipment 电气设备

The equipment of the electric system is limited to the contractually agreed scope of supply.

电气设备仅限于合同中规定的供应范围。

General power supply requirements

一般供电要求：

- 低压供电标准(DIN/IEC 38) 380 V -5/+10 %, 50 Hz -/+2 %
  3 phase/N/PE 50Hz
- 环境温度要求 10 - 40 °C
- 空气相对湿度要求 max. 80 %, 无凝露
- 安装高度 ≤1000 m

4 Storage and preservation 存储和保存

4.1 Storage area requirements 储藏室的要求

Building 厂房	• weather-resistant building shell 不受天气影响 • secured against access by unauthorized persons 入口要有安全防守，禁止非专业人员进入
Floor 地面	• hard-surfaced, water drainage assure 表面坚硬，排水良好 • for load capacity, please refer to the applicable foundation and installation drawing 请根据我们提供的安装图和地基要求来确定承载能力 • free from vibrations 消震 • accessible to means of transport and lifting/hoisting equipment 易接近运输和起吊设施
Ambient conditions 环境条件	• well-ventilated 通风良好 • dry 干燥 • dust-free in as far as possible 尽量无尘埃 • max. humidity 50 % 最大湿度50% • temperature approx. -20 °C to +40 °C 温度范围：-20 °C to +40 °C • altitude <1000m 海拔<1000m

4.2 Storage conditions 存储条件

Packed 包装的	• packages must be protected against penetration of water 包装箱必须防水 • do not stack packages, assure stability 不要把包装箱叠放在一起，保证它的稳定性 • package number must be visible包装箱的数量必须一目了然
Unpacked 未包装的	• units must be placed in clear arrangement, stability must be assured 设备各部件必须按序摆放，并保证其稳定性 • do not stack units不能堆放 • individual parts and tools must be stored in lockable room 个别零件和工具必须存放在封闭的空间

5 Service and maintenance 维修和保养

5.1 Maintenance and inspection schedule

时间间隔 Time interval	**检查/保养部位 Inspection/maintenance position**
每天 Every day	• 在操作过程中检查温度、压力的控制。 Check temperature, pressure control during operation. • 排除加工过程中出现的故障，如：泄漏和机械故障。 Eliminate faults to occur during processing such as leaks and mechanical failure.

时间间隔 Time interval	**检查/保养部位 Inspection/maintenance position**
运转 1000 小时 Total 1,000 hours of operation	• 第一次更换润滑油（请查 “润滑油表”）。 • Change lubricant oil first time (please refer to “Table of lubricants”).
每运转 8000 小时 Every 8,000 hours of operation	• 检查温度和压力控制装置。 • Check temperature and pressure control devices. • 更换润滑油（请查 “润滑油表”）。 • Change lubricant oil (please refer to “Table of lubricants”).

5.2 Table of lubricants 润滑油表

COWELL MACHINERY does not assume any responsibility with regard to the quality terms. Any liability is expressly excluded. The composition and name of the lubricants of the individual producers are subject to modification.The lubricants above-mentioned are recommended by COWELL MACHINERY. For further information see operating instructions of the suppliers. 科威机械对润滑油质量问题不承担任何责任。个别生产厂家的润滑油的成分和名称可能会有更改。更多信息请查看具体供应厂商的操作说明书。



润滑油不可食用，小心使用。

The lubricants are non-edible and must be used with caution.

Pos. no.	Description	ISO viscosity class identification	Mean viscosities mm²/s 40°C	100°C	Agip	ARAL	BP	EXXON MOBIL	Esso	FUCHS
1	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	100	11	Blasia 100	Degol BG 100	Energol GR-XP 100	Mobilgear 627	Spartan EP 100	Renolin 100
2	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	220	19	Blasia 220	Degol BG 220	Energol GR-XP 220	Mobilgear 630	Spartan EP 220	Renolin 220

3	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	320 24	Blasia + 320	Degol + # BG 320 Dego BG * 320PLUS*	Energol GR-XP 320 + # GR-XF 320 *	Mobilgear * 632 Mobilgear + # XMP 320	Spartan * + # EP 320	Renolin * 320 Renolin + 320 PLUS
Pos. no.	Description	ISO viscosity class identification	Mean viscosities mm²/s 40°C 100°C	Tribo	Optimol			Chevron	CALTEX
				CASTROL		Shell /	TEXACO		
1	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	100 11	Tribol 1100/100	Optigear BM 100	Omala 100	Meropa 100	compound EP 100	Meropa 100
2	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	220 19	Tribol 1100/220	Optigear BM 220	Omala 220	Meropa 220	compound EP 220	Meropa 220
3	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	320 24	Tribol * 1100/320	Optigear * + BM 320	Omala * # 320 Omala F + 320	Meropa + # 320	Compound + EP 320	Meropa 320

Pos. no.	**Description**	**ISO viscosity class identification**	**Mean viscosities mm²/s 40°C 100 °C**	TOTAL	LUB	*KLÜBER Lubrication*	SRS SCHMIERSTOFF VERTRIEB GMBH	ADDINOL	Sentinel Lubricants
1	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	100	Carter EP 100	Gearmaster CLP 100	Klüber-Oil GEM 1-100	Wintershall Ersolan 100	ECO Gear 100 M	---
2	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	220	Carter EP 220	Gearmaster CLP 220	Klüber-Oil GEM 1-220	Wintershall Ersolan 220	Eco Gear 220 M	---
3	Lubricating oil CLP acc. to DIN 51502	ISO VG acc. to DIN 51519	320	Carter + EP 320	Gearmaster CLP 320	Klüber-Oil + GEM 1 320	Wintershall * Ersolan 320	Eco Gear * 320 M	---

6 Trouble-shooting 故障排除

In the following tables, only those troubles of the units are described which can arise in connection with the gearbox operation. 在下面的表格中，将列出所有在机器运行过程中可能会发生的问题。

故障Fault	可能原因Cause	解决措施Solution
产生大量油沫 A large amount of oil foam is produced	• 进气管漏气 Air inlet pipe is leaking air • 防腐剂的残渣与齿轮油不相容 Preservative residue is incompatible with gear oil	• 重新紧固螺纹和法兰连接，必要时可以使用漏油监测器（噪音频率很高） Retighten screw thread and flange connections. If necessary, an oil leak monitor can be used (very high noise frequency) • 进行一次彻底的冲洗、换油 Rinse thoroughly once and change the oil • 采用另外一种型号的油 Use a different type of oil • 添加抑泡剂，添加之前必须和润滑油的生产厂家进行协商 When adding a foam inhibitor, the lubricant manufacturer must be consulted prior to adding
	• 油被杂质（尤其是化学物品）污染 Oil is contaminated by impurities (especially chemical products)	• 请润滑油的生产厂家或有资格的实验室进行红外线光谱分析，然后根据他们的意见进行处理 Ask the lubricant manufacturer or a qualified laboratory to conduct infrared spectroscopy analysis, then proceed according to their views
	• 润滑油使用太久 Lubricant has been used for too long	• 换油Change the oil
油变黑 Change the oil	• 使用太久 Used for too long	• 换油，最好在换油前经过分析 Change the oil, preferably analysing before the oil change
油变成乳状 Oil becomes milky	• 油中含有水分 Oil level is too high	• 换油，找出掺水的原因并排除 Lower the oil level to a specified position
轴隙漏油 Oil leaks in the axial gap	• 油位太高 Oil level is too high	• 将油位降低到规定的位置 Lower the oil level to a specified position
	• 回油管因堆积杂物而变窄 Oil return pipe is narrowed due to an accumulation of debris	• 检查回油管是否畅通并进行清理 Check whether or not the oil return pipe is smooth and clean

故障Fault	可能原因Cause	解决措施Solution
	可能原因Cause	解决措施Solution
	• 密封问题Seal problem	• 更换密封圈Replace seals
	• 油温太低 Oil temperature is too low	• 检测油温，按照需要升温 Detect oil temperature, heat as required • 检查加热功能 Check heating function
	• 漏油部位 Oil leak position： – 管接头Pipe coupling – 连接件Connector – 配件Accessory	• 重新紧固螺纹或法兰连接，必要时更换密封圈 Retighten screw thread or flange connections, replace seals when necessary • 密封或更换配件 Seal or replace parts
	• 过滤器堵塞：轴承、齿轮或油泵内部磨擦产生的金属屑 Filter is clogged: metal shavings produced by friction inside bearings, gears or the oil pump	• 检查清理过滤器并更换过滤网，如含杂质应分析其成分 Check and clean filter, and replace filter mesh; if it contains impurities, the composition should be analysed
	• 换油或更换过滤器时带入杂质 Impurities introduced when changing the oil or replacing the filter	• 检查维护过程 Check service process
	• 油老化或沉淀引起成分上的改变 Change in composition due to oil aging or precipitation	• 缩短换油周期，按照齿轮箱生产厂家的要求彻底冲洗齿轮箱和润滑系统 Shorten oil change intervals; thoroughly flush gearbox and lubrication system in accordance with the requirements of the gearbox manufacturer
	• 油冷却器和管道的积留物 Material accumulates in the oil cooler or piping	• 清洗或更换过滤器，必要时清洗油冷却器 Clean or replace filter; if necessary, clean oil cooler
	• 油温太低或粘度太大 Oil temperature too low or viscosity too great	• 检查油加热器的功能，使用适当粘度的油 Check oil heater function, use oil with correct viscosity
	• 溢流阀损坏 Relief valve damage	• 根据需要检查阀门并重新调节或更换 According to requirements, check valve and re-adjust or replace

故障Fault	可能原因Cause	解决措施Solution
	• 油过滤器堵塞 Oil filter is clogged	• 清洗油过滤器 Clean oil filter
	• 润滑油的温度太高 Lubricant temperature is too high	• 检查油冷却器 Check oil cooler • 检查冷却水的流量、温度等，必要时清理油冷却器通水端 Check cooling water flow rate, temperature and so on; when necessary, clean oil cooler through water end
	• 油的粘度不符合规格 Oil viscosity does not comply with specifications	• 使用粘度合适的润滑油 Use lubricant with appropriate viscosity
	• 油泵磨损，流速降低 Pump wear, reduced flow rate	• 拆卸油泵并进行检查，必要时更换其零件或整个油泵 • Remove oil pump and carry out inspection; when necessary, replace its parts or entire oil pump
	• 压力控制阀失灵 Pressure control valve failure	• 检查压力控制阀并进行调节，必要时更换 Check pressure control valve and adjust; if necessary, replace
	• 未完成加热 Incomplete heating • 加热器故障 Heater fault	• 等待油完全加热 Wait until oil is heated completely • 检查电气系统（保险丝、控制器） Check electrical system (fuses, controllers) • 检查加热器的功能 Check heater function
	• 冷却水的量太大 Cooling water volume too high • 冷却水控制器故障 Cooling water controller fault	• 检查冷却水控制器，必要时更换 Check cooling water controller and replace if necessary

故障Fault	可能原因Cause	解决措施Solution
	• 冷却水量不足或流速太低 Cooling water volume is insufficient or flow rate is too low • 冷却水温度过高 Cooling water temperature is too high • 冷却水控制阀门故障 Cooling water control valve fault • 热交换器有污染 Contamination of heat exchanger • 环境温度过高 Ambient temperature is too high	• 检查冷却水循环系统 Check cooling water circulation system • 排除主要故障，清洗相关设备，如有必要，进行更换。检查测量系统。 Eliminate major faults, clean related equipment and replace items if necessary. Check measurement system.
	• 齿轮油加热器未断电 Power is not turned off from gear oil heater	• 检查加热器的控制系统 Check heater control system
	• 主电机和齿轮箱之间的连接不好 Bad connection between main motor and gearbox	• 在设备运转的时候检查主电机和传动箱之间的联接，必要时进行调节 When equipment is in operation, check connection between main motor and gearbox and adjust if necessary
	• 联轴器不平衡 Coupling imbalance	• 见联轴器的故障排除栏 See coupling troubleshooting section
	• 轴承或齿轮损坏 Bearing or gear damage	• 配备必要的检查设备，必要时更换损坏部件 Fit necessary inspection equipment, replace damaged parts when necessary
	• 与底座间的连接松动 Loose connection between base frames	• 检查紧固元件并重新紧固，必要时考虑排列上的变化 Check fastening element and retighten; consider changes to arrangement if necessary
	• 外界震动通过机座传入传动箱 External vibration passing through the machine base into the gearbox	• 通常可以通过振动的频率来判断问题原因 Cause of problem can usually be determined by vibration frequency

故障Fault	可能原因Cause	解决措施Solution
	• 齿轮的齿或轴承损坏 Gear teeth or bearing damage	• 通过齿轮箱上的视察口检查旋转部件 Check rotating parts through the gearbox inspection hole • 分析油的成分（通过光谱分析的方法），要特别注意残留在过滤器上的金属屑的组成，进而确定它们的来源。必要时更换有缺陷的部件 Analyse oil components (through the spectral analysis method) paying special attention to the composition of metal shavings remaining on the filter so as to determine their origin. When necessary, replace defective parts
	• 从加工段传递过来的噪音，比如：塑化段的捏合块因塑化不完全产生噪音 Noise transmitted from processing section, such as: kneading block of plasticising section producing noise due to incomplete plasticising	• 这种情况通常发生在有大量颗粒或薄片混合在一起的时候，它可以造成筒体温度升高。检查螺纹元件的组合是否合适。 This situation usually occurs when a large number of particles or flakes are mixed together which can cause an increase in barrel temperature. Check screw thread element assembly is appropriate.
	• 电机为变频调速 Motor is an inversion type	• 请教电机控制方面的专家，减小震动。 Please consult an expert in motor control and reduce vibration.

7 Spare parts 备件

The operator must keep an inventory of needed spare parts in stock in order to assure that the unit operates smoothly and without unnecessary downtimes. 为了保证设备的正常运行，避免不必要的停工，操作人员必须对需要的备件做一些库存。

We will only warrant the original spare parts supplied by COWELL MACHINERY . Installation and use of spare parts not supplied by us will void the warranty on the part of COWELL MACHINERY . 我们只担保科威机械提供的原始备件，如果安装或使用了非科威机械所提供的备件，本公司将不承担任何责任。

为了便于我们快速、顺利地处理贵公司的备件订单，请提供下列资料：

In order for us to process your company's spare parts order quickly and smoothly, please provide the following information:

机型Model(e.g. COWELL-HT-75-60-600)

Cowell(Nanjing)Extrusion Machinery Co.,Ltd

南京市溧水区柘塘镇柘宁东路 329 号 1 幢

No.329, East Zhening Road,Lishui Industrial Zone,Lishui Distrct,Nanjing,

China.Email:info@cowellextrusion.com **TEL:86-159 9648 6859 185 5186 2351;** Fax:86-25-5269 2629