



南京高精船用设备有限公司

Nanjing High Accurate Marine Equipment Co., Ltd.

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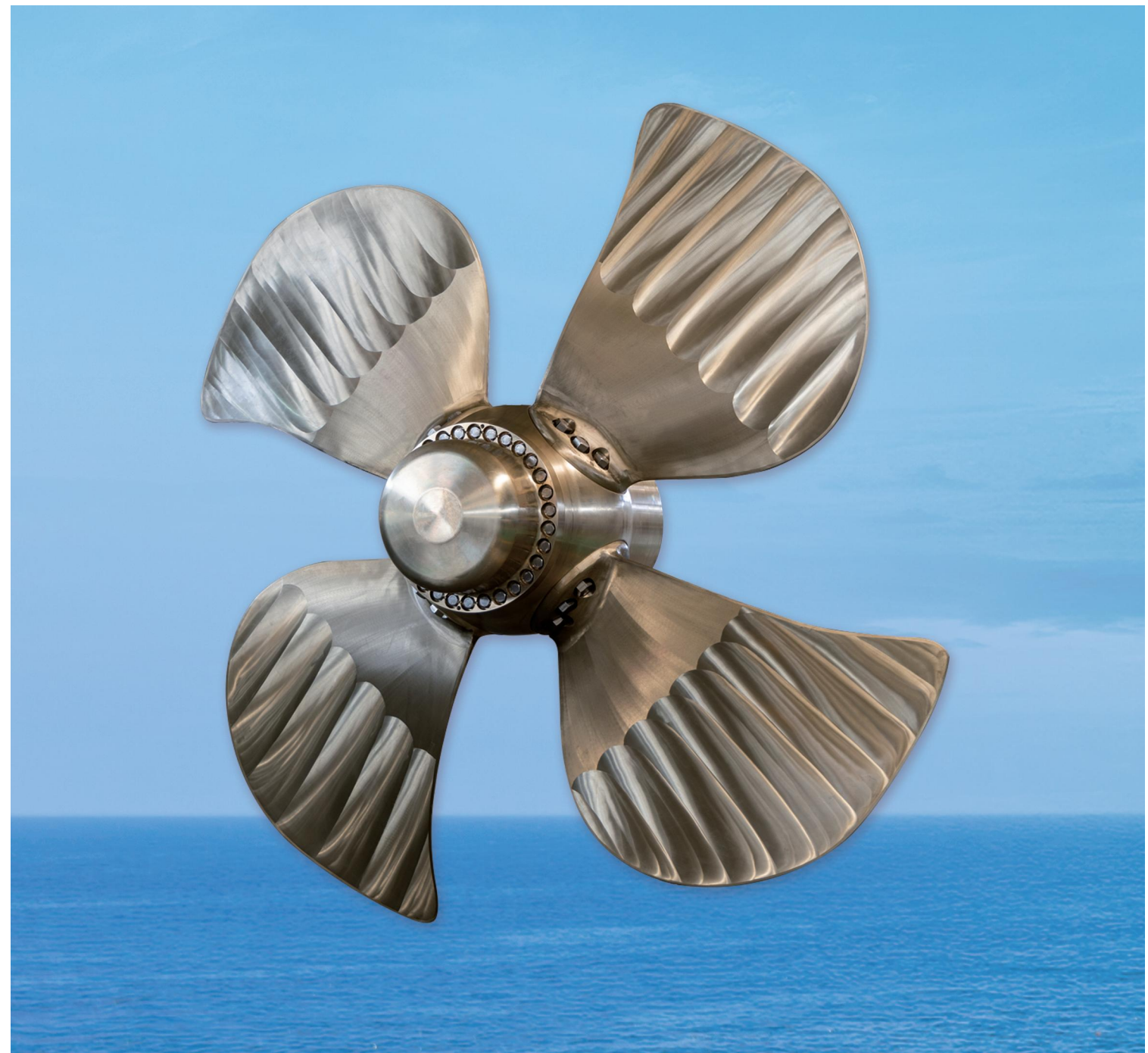
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2025



NCP系列可调桨推进系统

NCP Series Controllable Pitch Propeller System

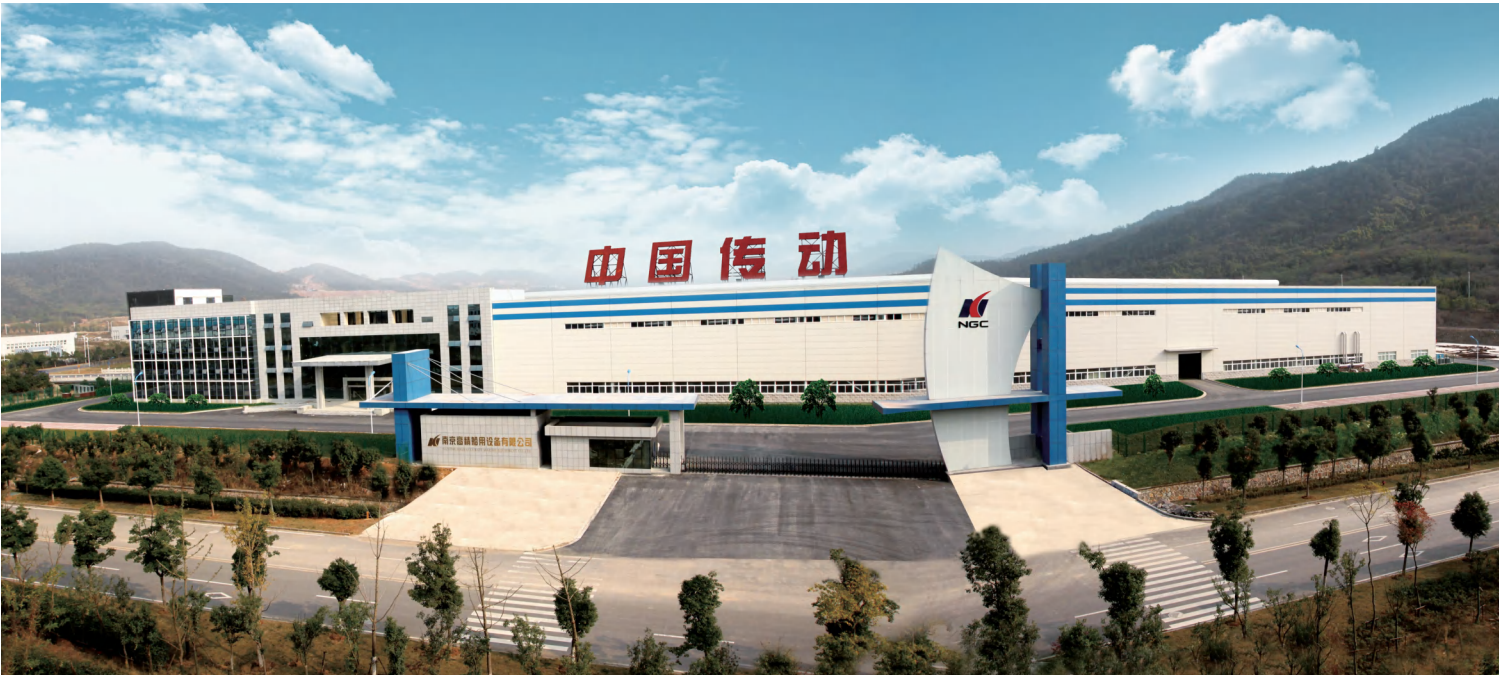


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Nanjing High Accurate Marine Equipment Co., Ltd.



公司简介
Company Profile

南京高精船用设备有限公司是“南高齿”集团在2007年将军民船用产品板块独立成立的公司，传承五十多年传动装备研制经验。目前是一家军民产品资质齐备的科技创新型高新技术企业，可为国内外高技术船舶和海工平台提供各种关键核心的传动和推进设备，包括可调桨、舵桨、电力吊舱、侧推、各种主/辅齿轮箱、高速齿轮箱、船用轴舵系部件及自升式平台升降系统等。

已建成占地近十六万平方米的厂区，配有先进的生产设备，形成年产1000多台套推进和传动设备的研制能力。公司建有完善的质量体系，已通过10多个船级社和ISO等认证。拥有专利150多项，公司40多次获得省/部和市等科技奖励。产品先后在国内外外的“大国重器”上成功应用，主打产品的技术指标和市场占有率位居国内同行前列。

通过国内外销售和售后网络已出口了数千条船的产品，产品质量达到国际标准，赢得客户和合作伙伴的高度认可。2021年被评为国家专精特新“小巨人”企业。

公司通过过硬的质量、优质的服务和持续的创新来塑造品牌，把建立国际一流的大型传动和推进设备企业作为目标，致力于为全球客户提供各种传动和推进系统的最佳解决方案。

Nanjing High Accurate Marine Equipment Co., Ltd. (NGC Marine) was autonomized from“NGC Group” for both commercial and military marine business in 2007. Being a high-tech innovative enterprise with complete qualifications for commercial and military businesses, NGC Marine supplies varieties of key transmission and propulsion equipment for global high-tech vessels and offshore platforms including controllable pitch propellers (CPP), azimuth thrusters, NEpod thrusters, tunnel thrusters, various main/auxiliary marine gearboxes, high speed gearboxes, marine shafting and rudder system components, and jack-up platform systems, etc. NGC Marine has achieved an annual production capacity exceeding 1,000 sets of propulsion and transmission equipment through its advanced production facilities and large factory area of nearly 160,000 square meters. The company has established a comprehensive quality management system, obtaining certifications from more than 10 Classification Societies and ISO Standards. NGC Marine attaches importance to technology and innovation, winning over 150 patents and more than 40 provincial/ministerial and municipal awards for scientific and technological achievements. And the products have successfully applied in major national projects both domestically and overseas, with the technical specifications and market share of its flagship products ranking among the top in the domestic industry. With product quality meeting international standards and earning great recognition from clients and partners worldwide, NGC Marine has supplied equipment for thousands of vessels through its extensive global sales and after-sales network. In 2021, the company was designated as a National Specialized, Unique, and Innovative "Little Giant" Enterprise, which proves its innovation-driven development and industry leadership. NGC Marine is committed to building a globally recognized brand through superior product quality, exceptional service, and continuous innovation. The company aspires to become a world-class provider of large-scale transmission and propulsion systems, delivering optimal solutions to meet the diverse needs of its global clients.

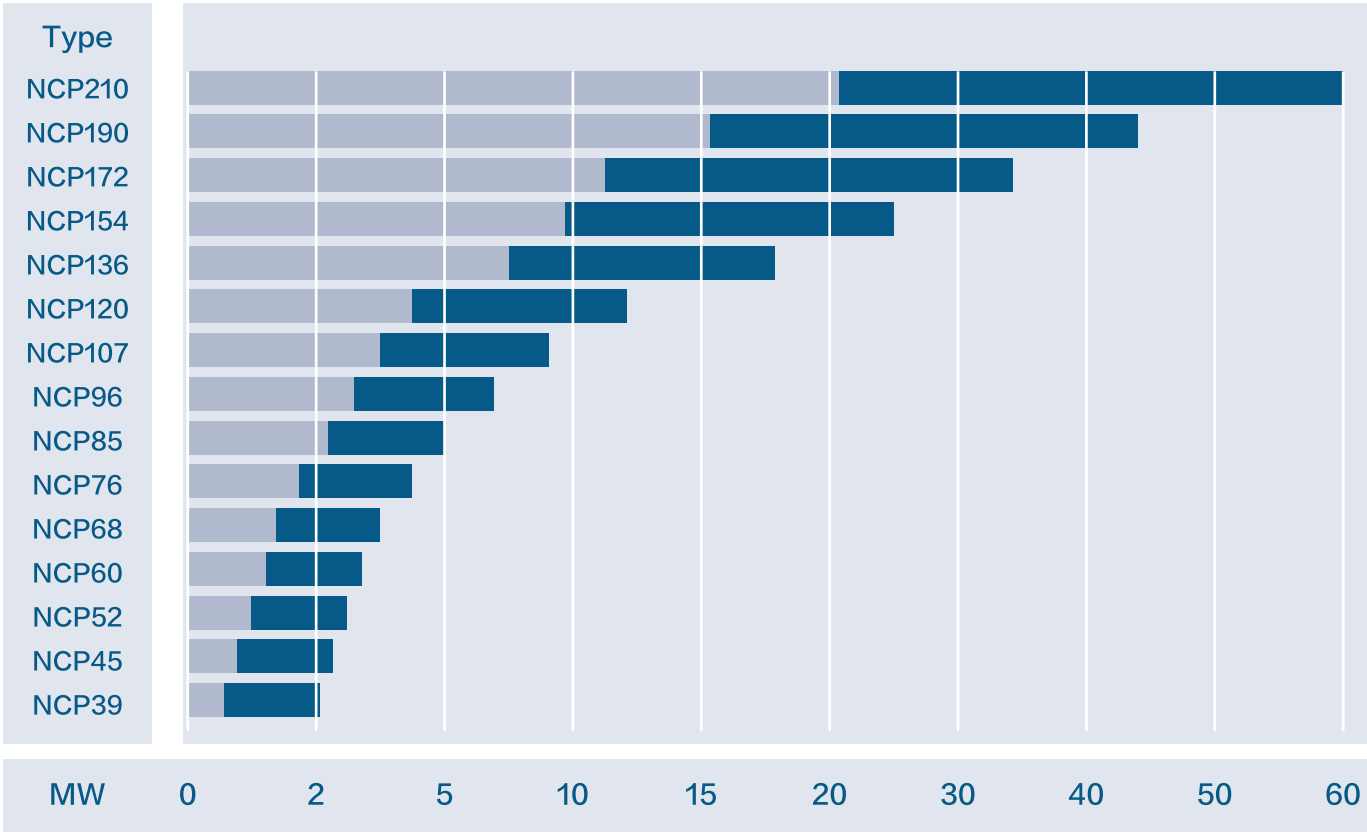
NCP系列可调桨
NCP Series Controllable Pitch Propeller

NGC Marine是国际大型可调桨推进系统供应商，近10年来已经生产了1000多套可调桨，其质量达到国际标准，并大量出口海外市场，赢得客户和合作伙伴的高度认可。目前公司已经建立了全球的销售和售后服务网络，且所选的配套件都具有全球联保服务。

NGC Marine is a large international supplier of controllable pitch propeller (CPP) propulsion systems. Over the past 10 years, the company has produced more than 1,000 sets of CPP. With quality meeting International Standard, the products from NGC have been exported to overseas markets in large quantities, winning high recognition from customers and partners. At present, NGC Marine has established a global sales and after-sales service network, and the accessories used come with global warranty service.



NCP可调桨系列参数表
NCP Series Controllable Pitch Propeller Diagram



NCP系列可调桨

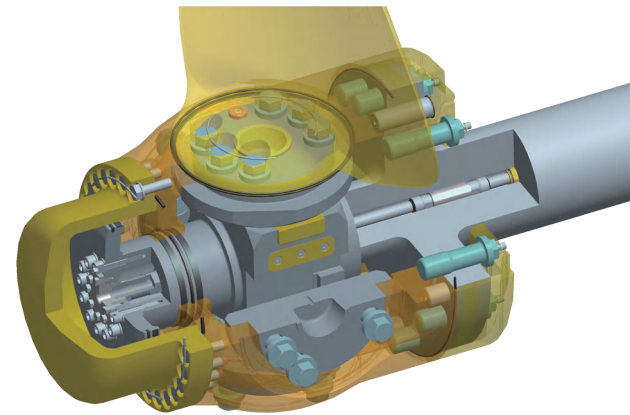
NCP Series Controllable Pitch Propeller

为适应于恶劣的海洋环境，NGC Marine的开发人员在水动力计算、结构设计、材料选择时，充分考虑到可调桨的可靠性要求，使NCP系列调距桨具有可靠性好、结构简单和便于操作维护等特点。桨毂采用大直径伺服活塞结构，活塞上形成的液压力直接作用在导架上，从而降低了液压系统所提供工作油的压力。

To adapt to the harsh marine environment, NGC Marine engineers have taken full consideration of reliabilities of CPP during the hydrodynamic calculation, structural design, and material selection, which make NCP series CPP featured with good reliability, simple configuration, friendly operation and maintenance. The hub is designed with the structure of large-diameter servo piston, where the hydraulic force formed directly works on the yoke, so as to reduce the pressure of the working oil required by the hydraulic system.

在螺旋桨设计过程中，采用大侧斜螺旋桨和优化盘面比等措施，并与试验相结合，有效降低螺旋桨的空泡和振动，不仅可以满足航速、拖力等性能，而且提高整条船的使用性能和经济性。

Combining the test to the propeller design, we apply the large skew propeller and optimal disc ratio solutions to lower down the cavitations and vibration of the propeller, in this way, not only the navigation speed and towing force can be satisfied, but also the operation performance and economical efficiency of the ship is improved.



轴系设计充分考虑随着船舶载荷的变化，螺旋桨受力、齿轮啮合负载力和主机曲轴产生弯曲应力等综合不利因素对轴系强度、振动和校中的影响，使得计算结果与实际工况更加贴近或吻合。

During the shafting design, the engineers take full account of the combined adverse effects of propeller forces, gear meshing loads, and bending stresses generated by the main engine crankshaft under varying ship loads on the strength, vibration, and alignment of the shafting system. This ensures that the calculated results align more closely or match the actual operating conditions.

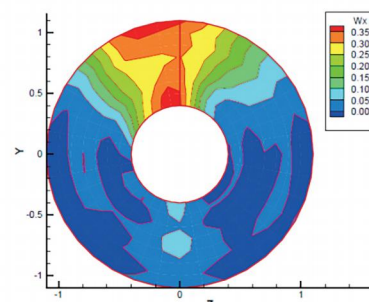
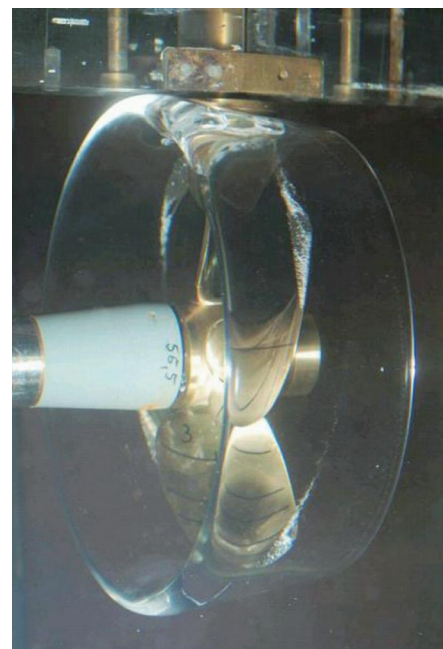
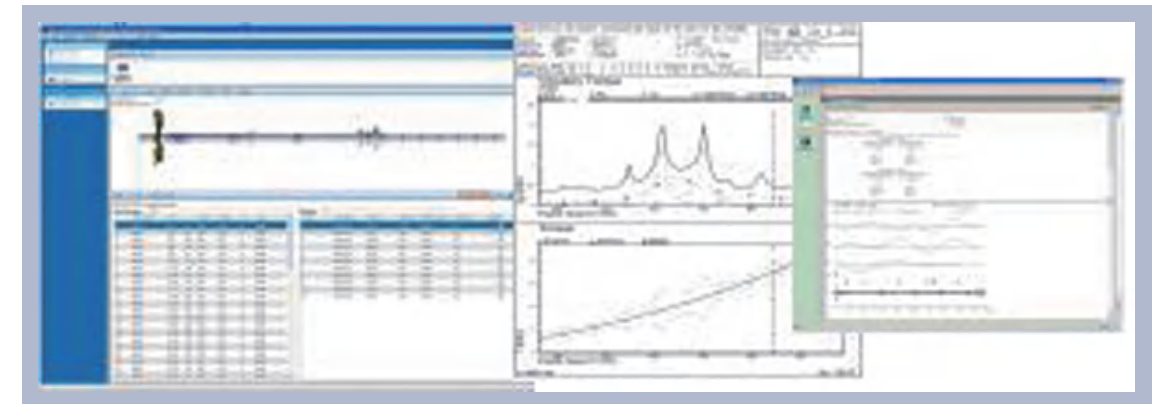
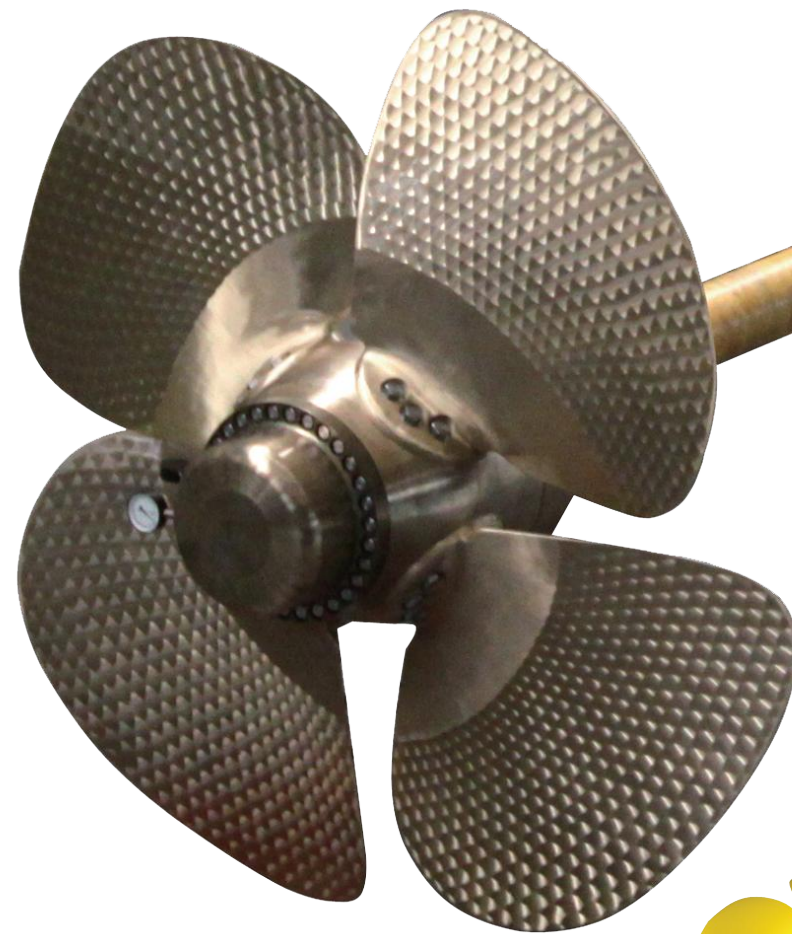
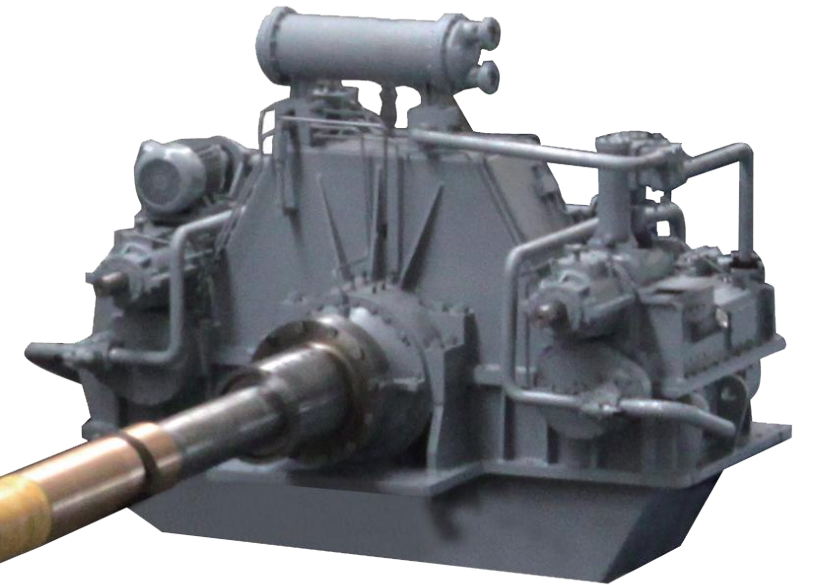
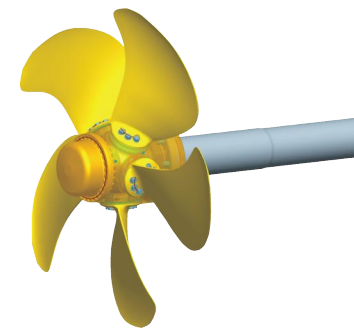
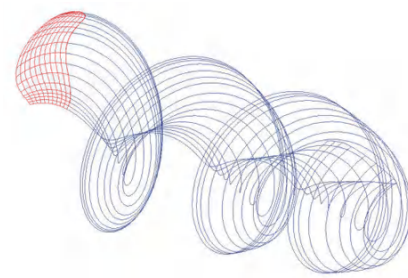
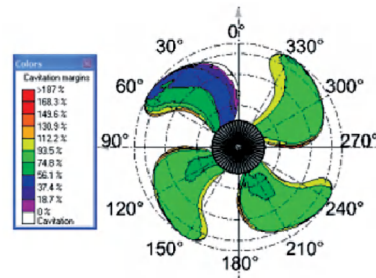
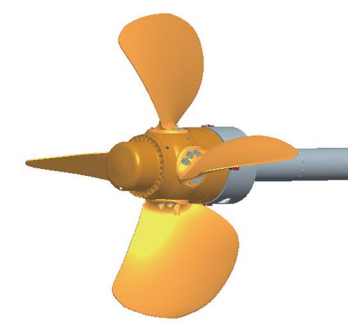


Figure 6.1 The contours of axial wake



五叶可调桨
5-blade CPP



顺水可调桨
Feathering-capable CPP

船舶航行时，顺水可调桨如不工作时，可将桨叶调节至顺水状态，有效降低其阻力。

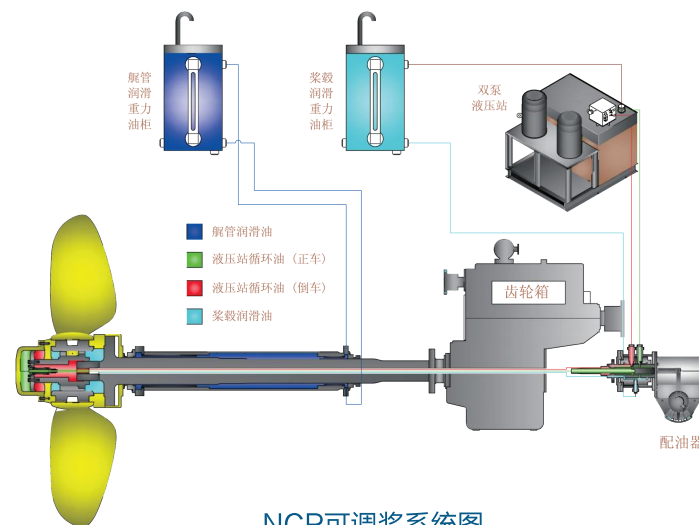
When the ship is sailing downstream, if the controllable pitch propeller is not in operation, the blades can be adjusted to feathering position, which could effectively reduce the resistance.

液压系统 Hydraulic System

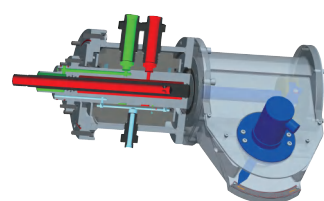
NCP系列可调桨的液压系统由配油器和液压泵站等组成。液压泵站有单泵和双泵液压泵站两种型式。其中单泵液压泵站作为备用泵使用，主泵为齿轮箱驱动的机带泵。双泵液压泵站有两组电动泵，可自动实现主备切换。

配油器型式有安装齿轮箱前端或轴系上两种结构，通过大量的实船检验，这两种配油器具有结构可靠、操作灵活等特点。

The hydraulic system of the NCP series CPP consists of OD box and hydraulic power unit, and the power unit is available in two types: single-pump and dual-pump. The single-pump power unit serves as a standby pump, with a gearbox-driven belt pump as the main pump. The dual-pump powerunit has two sets of electric pumps, which can realize automatic switching between the main and standby pumps. The OD Box can be mounted in front of the gearbox or on the shafting. Through extensive real-ship testing, these two types of arrangements are attested to be structurally reliable and operationally flexible.



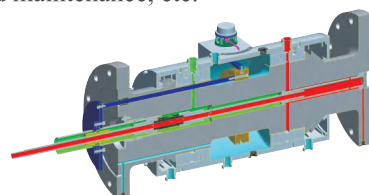
NCP可调桨系统图
NCP series CPP system diagram



ODG型配油器
ODG type OD box

ODG型配油器安装在齿轮箱输出轴上，具有体积小、工作可靠和易于安装维护等特点。

ODG type OD Box is installed on the gearbox output shaft, featured with small size, reliable operation, easy installation and maintenance, etc.



ODS型配油器
ODS type OD box

ODS型配油器安装在推进轴系上，常用于低速柴油推进系统和长轴系系统中。

ODS type OD box, installed on the propulsion shaft line, normally is used in the low speed diesel engine propulsion and long shaft system.

特点 Features

- ☆ 调节阀采用欧洲比例阀
- ☆ 泵采用进口变量泵
- ☆ 采用阀块式设计，管路简单，安装维护方便
- ☆ 具备油水监测功能
- ☆ European proportional valve;
- ☆ Imported variable displacement pump;
- ☆ Valve block design, simple piping, easy for installation & maintenance;
- ☆ Oil-monitoring function



水处理装置
Water Treatment Unit

NGC Marine水处理装置用于水润滑艉管轴承的冷却，可以提高水润滑轴承的使用寿命，具有安全可靠和维护方便等特点。

The NGC Marine water treatment unit is used for cooling water lubricated stern tube bearings, which can improve the service life of water lubricated bearings and has the characteristics of safety, reliability, and easy maintenance.

控制系统 Remote Control System

NCP6000遥控系统是基于PLC的全随动推进控制系统，是以主机的转速、CPP的螺距和齿轮箱的合脱排等为主要控制对象，不仅可以显示船舶当前工作状态，也可以进行远程故障诊断和应急处理。具有良好的扩展性、人机界面友好、可靠性高和易于操作等优点，广泛应用在各种船型中。

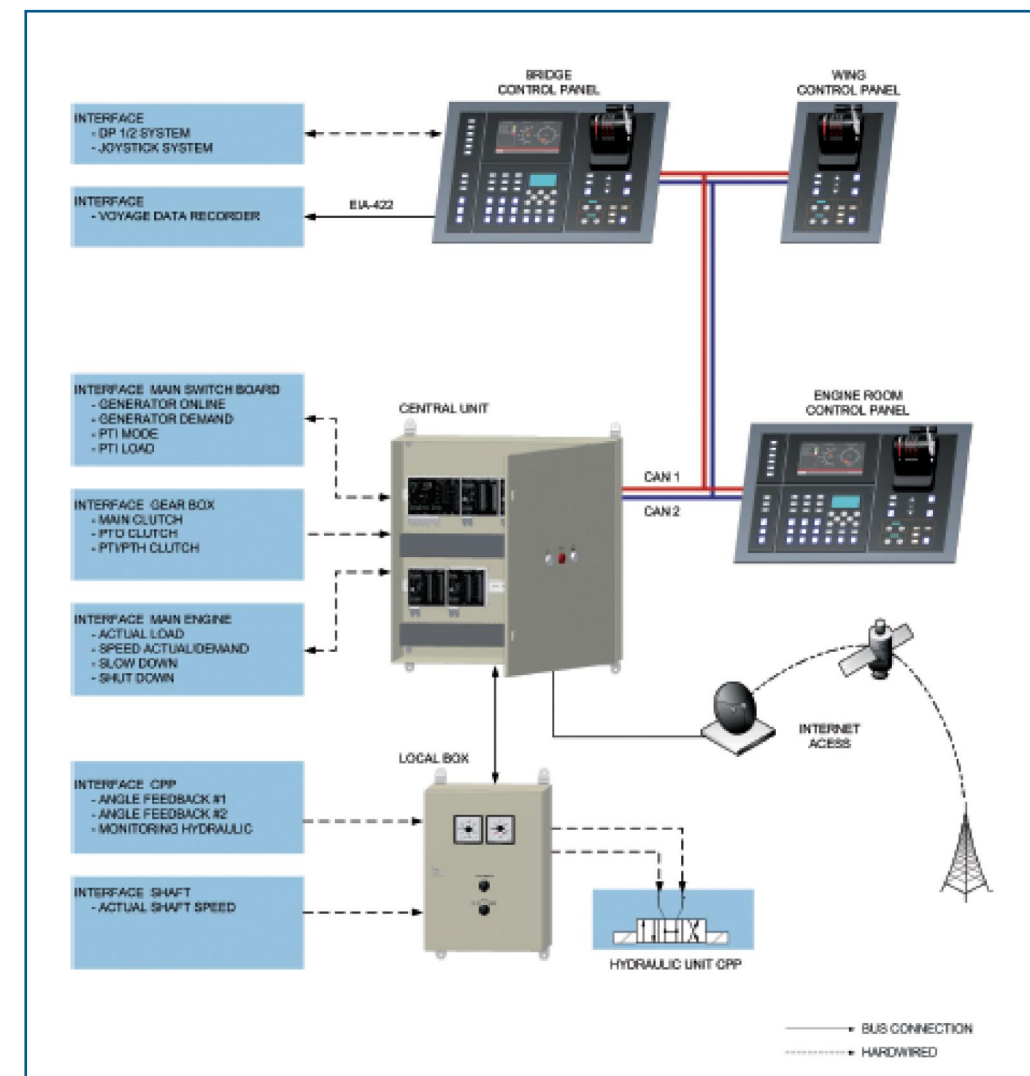
NCP6000 remote control system, is the fully follow-up control system based on PLC, and its main control points are main engine speed, CPP pitch and gearbox clutch-in/out. It can not only display the current work condition of the ship, but also can carry out the remote failure diagnosis and emergency treatment. This type of control system is designed with good expansibility, friendly human-computer interface, high reliability and easy operation, etc, and has been widely used in all types of vessels.

主要功能 Main Functions

- | | |
|-----------|---------------------------------------|
| 螺距控制 | Pitch control |
| 主机转速控制 | ME speed control |
| 离合器控制 | Clutch control |
| 主机负荷控制和安保 | ME load control and safety protection |

控制模式 Control Mode

- | | |
|---------------|-----------------------|
| 恒转速模式 | Constant speed mode |
| 联控模式 | Combine control mode |
| 分控模式 | Separate control mode |
| DP或JOYSTICK模式 | DP or JOYSTICK mode |



柴油机驱动 Diesel Engine Drive

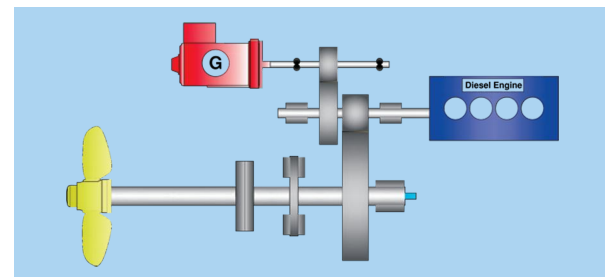
NGC Marine除了自行设计生产的可调桨和齿轮箱能满足各种结构推进系统的要求外，并能为客户提供整套推进系统打包服务，包括主机及控制系统、监测报警系统、高弹联轴器、中间轴承等。这样对于船舶设计和船舶建造方来说，既可以得到专业的服务，又可以节约成本，缩短建造时间。

In addition to self-designed and manufactured controllable pitch propellers (CPP) and gearboxes that meet the requirements of various propulsion system configurations, NGC Marine can also provide customers with complete packaged propulsion system solutions, including main engines and control systems, monitoring & alarm systems, high flexible couplings, intermediate bearings, etc. For ship designers and builders, this approach not only ensures professional support but also reduces costs and shortens construction timelines.

单机单桨系统 Single Screw Propulsion System

单机单桨系统柴油机通过齿轮箱减速驱动CPP和PTO。齿轮箱通常不配置主离合器，主机启动后，PTO输出轴同时旋转。常用于集装箱船、油轮、货船和渔船等船型。

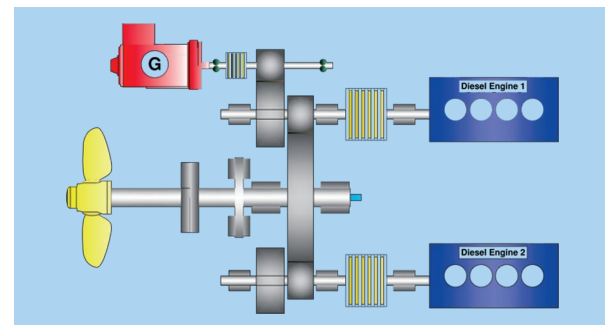
The diesel engine of single screw propulsion drives the CPP and power take-off (PTO) through a reduction gearbox. The gearbox is typically equipped without a main clutch, so the PTO output shaft rotates simultaneously upon engine startup. This configuration is commonly used in vessel types such as container ships, oil tankers, cargo vessel, and fishing vessels.



双机并车系统 Twin-in Single-out System

主机为两台柴油机（一主一从），通过双机并车齿轮箱减速驱动CPP和PTO。齿轮箱通常配置主离合器，实现主机和从机的先后并车操作。

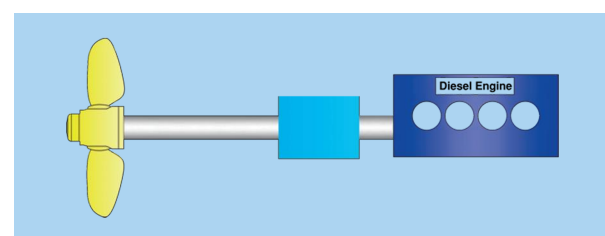
The main engines are two diesel engines (one primary, one secondary), which drive CPP and PTO through a twin-in single-out reduction gearbox. The gearbox is typically equipped with main clutch to enable sequential engagement of the primary and secondary engines.



低速机+CPP系统 Low Speed Engine + CPP System

CPP直接由低速柴油机驱动，螺旋桨的推力由柴油机承受。通过隧道齿轮箱驱动轴带发电机，用于船舶自由航行时的全船供电，有效节约成本。该系统常用于大型货船、化学品船、集装箱船和LNG等船型。

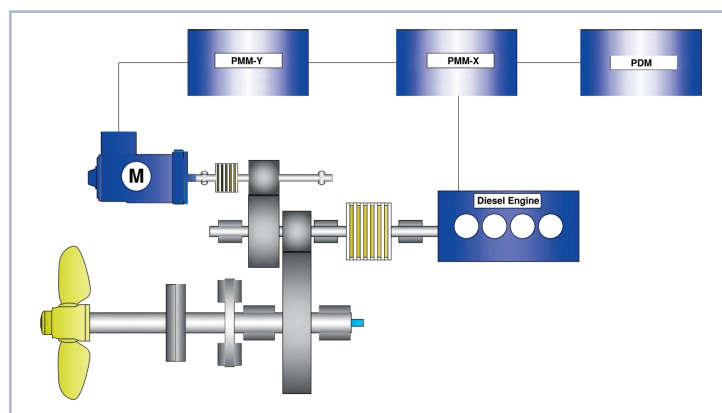
The CPP is directly driven by a low-speed diesel engine, with the propeller thrust being absorbed by the engine itself. The system incorporates a tunnel gearbox to drive the shaft generator, which supplies power to the entire vessel during free sailing, resulting in significant cost savings. This configuration is commonly employed in large cargo ships, chemical tankers, container vessels, and LNG carriers.



联合推进系统 Hybrid propulsion system

联合推进系统同样为一些多工况船型配置。通过推进方式的转换，可选择合适的推进方式，非常适合轻载和重载工况运行，有效降低燃油消耗。该系统由柴油机和电机(或轴发)通过减速齿轮箱单独或同时驱动CPP。船舶在轻载工况下由电机驱动CPP实现低航速运行。船舶在重载情况下，有柴油机和电机同时驱动CPP，满足高航速或拖带作业工况要求。

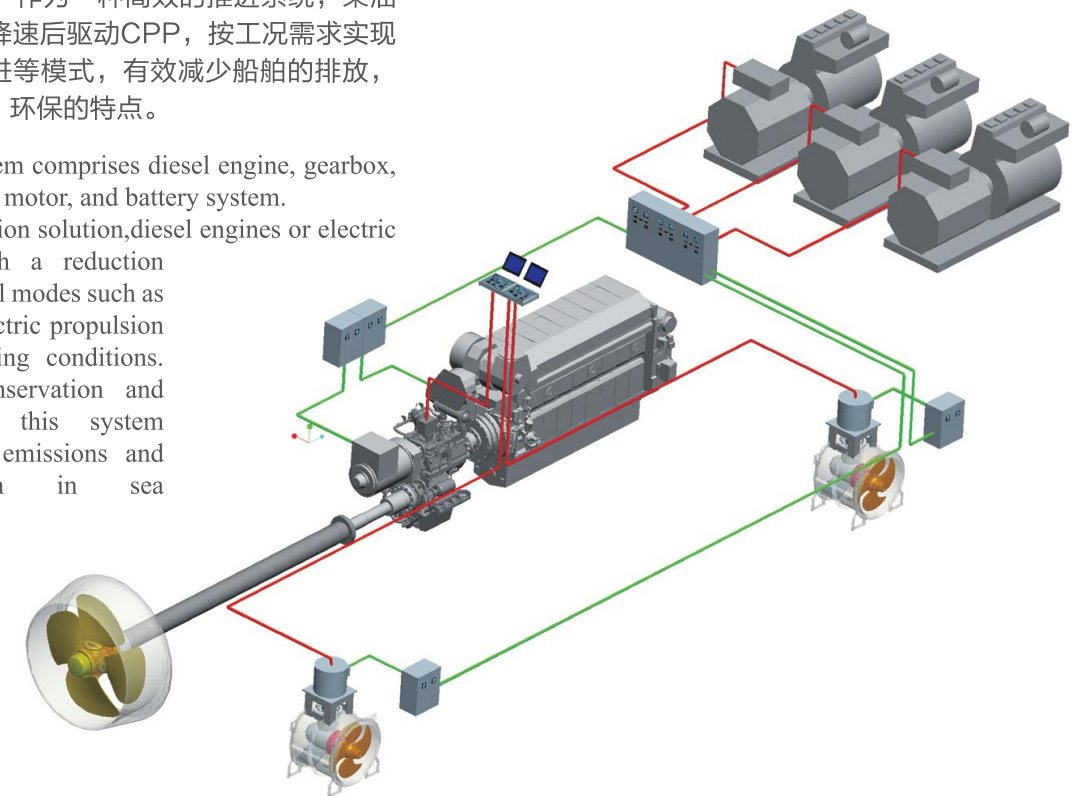
This system is also equipped for vessels in multi-working conditions. The propulsion mode can be selected according to real work condition to decrease the fuel consumption. CPP is driven by the gearbox via diesel engine and electric motor (or shaft generator), solely or simultaneously. Under the light load, CPP is driven by the electric motor to realize low speed navigation; under the heavy load, CPP is driven by the diesel engine and electric motor together to satisfy the requirements of high speed or towing work condition.



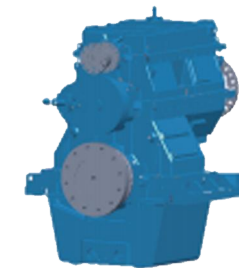
混合动力推进系统 Hybrid Propulsion System

混合动力推进系统由柴油机、齿轮箱、CPP、轴带发电机、电机和电池系统组成。作为一种高效的推进系统，柴油机或电机通过减速齿轮箱降速后驱动CPP，按工况需求实现PTO/PTI/PTH或纯电推进等模式，有效减少船舶的排放，实现海运脱碳，具有节能、环保的特点。

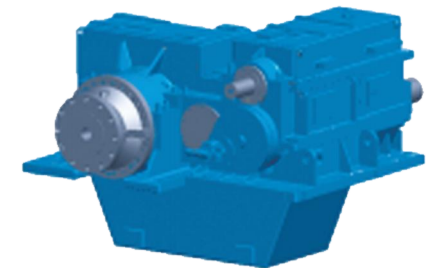
The Hybrid Propulsion System comprises diesel engine, gearbox, CPP, shaft generator, electric motor, and battery system. As a highly efficient propulsion solution, diesel engines or electric motors drive CPP through a reduction gearbox, enabling operational modes such as PTO, PTI, PTH, or pure electric propulsion according to actual operating conditions. Featured with energy conservation and environmental protection, this system effectively reduces vessel emissions and achieves decarbonization in sea transportation.



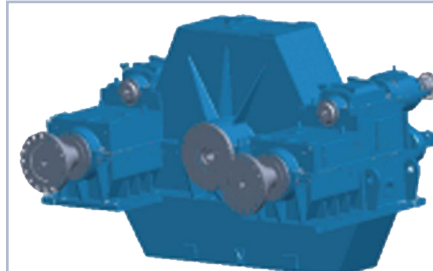
NGC生产的CK系列 可调桨齿轮箱 CK series non-resersible gearboxes



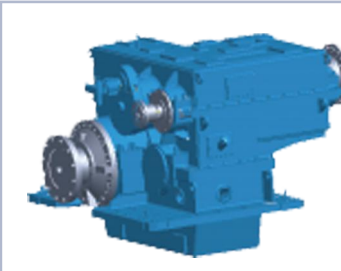
垂直偏心结构 Vertical offset
CKV440-CKV2000 1~100kW/RPM



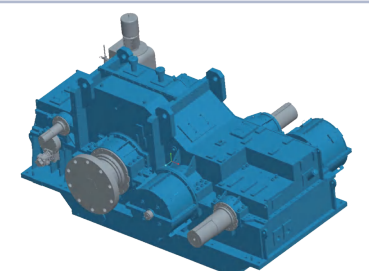
水平偏心 Horizontal offset
CKH440-CKH2000 1~100kW/RPM



双机并车 Twin-in single-out
CKTS1000-CKTS2050 1~50kW/RPM



斜向偏心 Oblique offset
CKS440-CKS2000 1~100kW/RPM



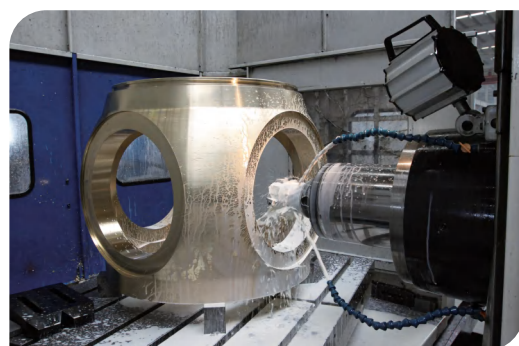
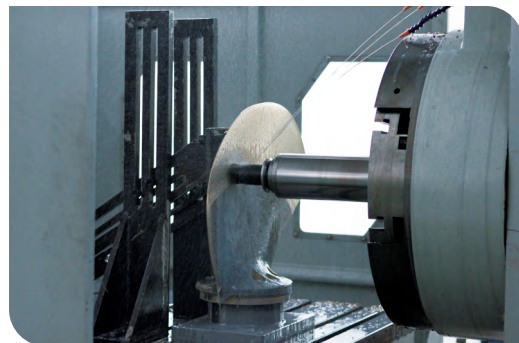
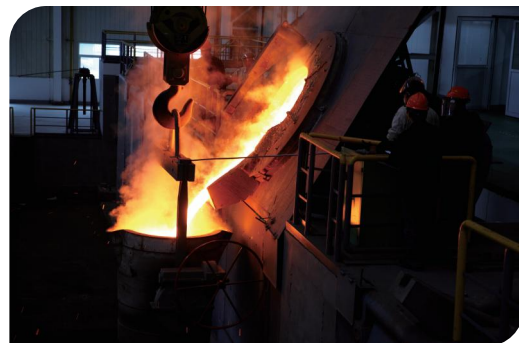
联合推进齿轮箱 Hybrid propulsion gearbox
CKTSF500-CKTSF1250 4~50kW/RPM

生产检验

Process Inspection

产品质量管理和控制完全按照欧洲标准进行，并实现全球销售和售后服务。

The quality control and management is carried out according to European Standard. Global sales and after-sales service is available.



安装调试

Installation Commissioning and Sea Trials

NGC Marine拥有经验丰富的项目团队，分别负责项目管理、设计、生产检验、安装调试和海试等相关工作。

NGC Marine has an experienced project team to take charge of the project management, design, process inspection, commissioning and sea trial.



轴系吊装
Shafting Lifting & Installation



现场铰配
Field Reaming & Fitting



电控调试
Remote Control Commissioning

NCP系列可调桨和齿轮箱已大量运用在海洋平台工程船、油轮、挖泥船、海监船、集装箱船和拖轮等多种船型上。

NCP series CPP and gearbox have been widely used in ocean platform workboat, oil tanker, dredger, ocean surveillance vessel, container ship and tugboat, etc.

