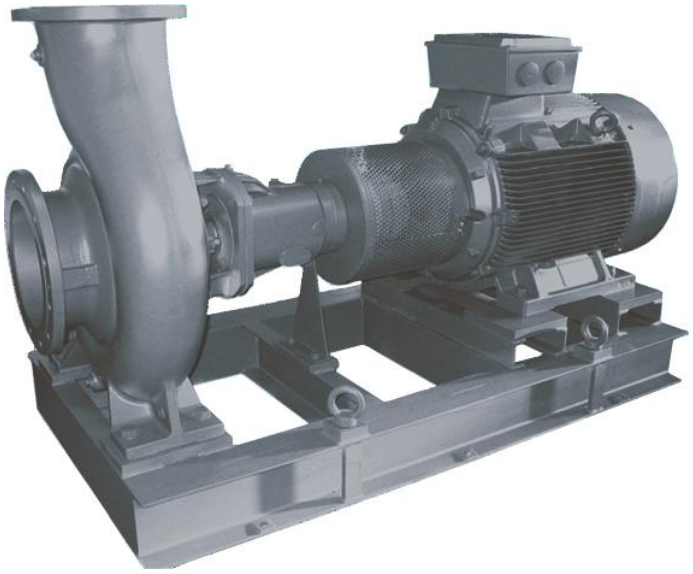
安装及操作维护说明书

Installation and Operating Instruction Manual

LNP&GNP&INP&SNP 系列卧式端吸离心泵

Flexibly-Coupled End-Suction pumps



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COOX PUMPS INDUSTRIAL(SHENZHEN)CO,LTD

1. General

1.1 About this document

These Installation and Operating Instructions form an integral part of the unit. They must be kept close to the unit and in readiness whenever required. Precise observance of these instructions is a precondition for use of the unit for the intended purpose and for its correct operation. These Installation and Operating Instructions conform to the relevant version of the equipment and the underlying safety standards valid at the time of going to prese.

1. 概述

1.1 关于安装操作使用说明书

安装操作使用说明书是构成设备的重要部分，是正确使用设备和保证设备正常运行的前提条件。安装操作使用说明书符合相应的设备要求以及遵守下面的安全标准。

2. Safety

This leaflet contents all safety instructions which must be followed when installing and operating the pump. It is therefore imperative that they be read by both the installer and the operator before the pump is installed or operated. Both the general safety instructions in this section and the more specific safety points in the following sections should be observer.

2.安全说明

在安装和使用水泵时必须遵守下面的安全说明。安装和操作人员在安装和使用水泵之前请认真阅读并使用说明书中的安全说明。

2.1 Instruction symbols used in this operating manual 说明书中使用的符号

Symbols 符号

 General danger symbol 危险符号

 Hazards from electrical causes 有电危险

 NOTE: .... 注意：

Signal words:

DANGER! Imminently hazardous situation. Will result in death or serious injury if not avoided.

WARNING! Risk of (serious) injury. 'Warning' implies that failure to comply with the safety instructions is likely to result in (severe) personal injury.

CAUTION! Risk of damage to the pump/installation. 'Caution' alerts to user to potential product damage due to noncompliance with the safety instructions.

NOTE! Useful information on the handling of the product. It alerts the user to potential difficulties.

信号词：

危险！危险情况。如不消除将引起死亡或严重损伤。

警告！严重伤害。如不遵守操作说明书中的安全须知将引起人身伤害。

警告！水泵及安装的损坏。警告使用者忽视有关的安全须知将对水泵及其功能造成损坏。

注意！有关水泵问题处理的有用信息。警示使用者潜在的困难。

2.2 Personnel qualification

The personnel installing the pump must have the appropriate qualification for this work.

2.2 操作人员资质

安装水泵人员必须具有相应的资质。

2.3 Risks incurred by failure to comply with the safety instructions

Failure to comply with the safety precautions could result in personal injury or damage to the pump or installation. Failure to comply with the safety precautions could also invalidate any claim for damages. In particular, failure to comply with these safety instructions could give rise, for example, to the following risks:

• Failure of important pump or system functions,

• Personal injury due to electrical, mechanical and bacteriological causes.

2.3 不遵守安全须知造成的损害

不遵守安全防范措施可能会造成人员损伤或水泵及安装损坏。尤其造成危险，例如：

• 造成水泵或系统功能的损坏。

• 电气，机械和生物原因造成的人员伤害。

2.4 Safety instructions for the operator

The relevant accident precaution regulations must be observed.

Potential dangers caused by electrical energy must be excluded. Local or general regulations [e.g. IEC, VDE, etc.] and directives from local energy supply companies are to be followed.

• If high or low temperature pump/pump set components involve hazards, steps must be taken to avoid accidental contact.

• Guards for moving parts (e.g. couplings) must not be removed from the pump/pump set while in operation.

• Any leakage of hazardous (e.g. explosive, toxic, hot) fluids (e.g. from the shaft seal) must be drained safely so as to prevent any risk to persons or the environment. Statutory regulations are to be complied with.

•The pump should not in any case to running without liquid. The destruction of the sealing end shaft which can result from such a use would cause leakes of fluid damaging the safety of the people and the environment.

2.4 对操作者的安全须知

必须遵守相关的应急条例。

必须排除由电能造成的潜在的危险，必须遵守本地或一般法规【例如.IEC.VDE等】及本地的能源供应公司的法规。

• 如果高温或低温的水泵部件具有危险隐患，必须避免采取应急措施。

• 转动部件的防护装置（例如联轴节）不允许在水泵运转过程中取下。

• 任何危险（爆炸的，有毒的，热的）流体（例如从轴封处泄漏的流体）必须安全排放，防止环境和人员造成伤害。必须遵守法律法规。

• 水泵不允许干转。由干转造成密封和轴的破坏，引起流体的泄漏对人员和环境造成损害。

2.5 Safety instructions for inspection and assembly

The operator must ensure that all inspection and assembly work is carried out by authorised and qualified specialists who have carefully studied these instructions.

Work on a pump or installation should only be carried out once the latter has been brought to a standstill.

Pumps and pump sets, which convey hazardous media, must be decontaminated.

On completion of the work all safety and protective guards must be re-installed and made operative again.

Prior to re-starting the machine, the instructions listed under “first commissioning” are to be observed.

2.5 组装和检查人员的安全须知

操作人员必须确保检查和组装工作由授权和仔细阅读安装使用说明书的人员来负责。

只有在水泵停止运转时，才能进行水泵安装。

输送危险介质的水泵和水泵系统必须要消除污染。

一旦工作完成，必须保证所有的安全和保护装置重新安装并投入使用。

重新启动水泵时，必须遵守安装使用说明书中的“首次调试”章节。

2.6 Unauthorised modification and manufacture of spare parts

Changes to the pump/machinery may only be made in agreement with the manufacturer. The use of original spare parts and accessories authorised by the manufacturer will ensure safety. The use of any other parts may invalidate claims invoking the liability of the manufacturer for any consequences.

2.6 自行设备改装和自制配件

自行改装设备或安装必须经过制造商同意。使用原始备件和制造商授权的产品将确保安全。使用其他配件，制造商将不承担由此引起的任何后果和责任。

2.7 Improper use

The operating safety of the pump or installation can only be guaranteed if it is used in accordance with paragraph 4 of the operating instructions. All values must neither exceed nor fall below the limit values given in the catalogue or data sheet.

2.7 不允许的使用条件

厂方仅保证在说明书第 4 节范围内使用可靠，不允许逾越产品样本或技术参数表中规定的极限值。

3. Transport and storage

When receiving thematerial, check that there has been no damage during the transport. If any defect has been stated, take the required steps with the carrier within the allowed time.

⚠ **CAUTION!** If the delivered material is to be installed later on, store it in a dry place and protect it from impacts and any outside influences (humidity, frost etc...).

Handle the pump carefully so as not to damage the unit prior to installation.

3. 运输和存储

在收到货物时请核对在运输过程中是否没有损坏。如有任何问题，在允许的时间内，请与运输公司人员联系采取必要的措施。

⚠ **警告！**如果水泵不立即安装，应存放在干燥，无霜冻等环境中，严禁受到外力碰撞。应小心搬运水泵，以免损坏水泵，影响安装。

4. Product

⚠ **CAUTION!** The pump is to be used only for the operating conditions stated by the customer and confirmed by the supplier. Guarantee is assumed within the scope of the Coox conditions of sale.
Appropriate application and operating conditions are contained in the attached data sheets.

4. 水泵

⚠ **警告！**水泵仅可以在由客户要求和供应商确认的运行条件下使用。克奥兹公司保证在销售范围内的产品条件。
应用和运行条件包含在附页的参数表中。

4.1 Safety instruction

⚠ **CAUTION!** Never touch the pump casing before a cooling period.

The pump may only be used for the application(s) stated.
Otherwise hazards for people and environment must be avoided.

⚠ **CAUTION!** Do not apply any thermal chocs to the pump. Never cool it with cold water.

Do not exceed fluid density stated. Otherwise, there is a the danger of motor overload.
The pump must not be operated beyond its characteristic curve – otherwise there is a danger of cavitation and motor damage.

4.1 安全须知

⚠ 警告！在水泵冷却之前禁止触摸泵体。

水泵仅用于应用方面。
另外，必须避免对人员和环境造成损坏。

⚠ 警告！不允许使用任何过热的介质加热水泵，也不允许使用冷水来冷却水泵。

不允许超过水泵要求的介质密度使用条件。否则会使电机过载造成危险。

4.2 Construction and mode of operation

INP&LNP&GNP&SNP pumps are horizontal, single-stage volute casing pumps with nominal outputs. Their back pull out construction allows the disassembly of the complete bearing unit towards the drive side without removing the pump casing from the pipework.
INP&LNP&GNP&SNP pumps are preferably used when pure or turbid liquids, not containing solid particles, are to be handled.
Impurities up to a grain size of 3 mm can be handled, but it will shorten the service life.

4.2 构成和运行方式

INP&LNP&GNP&SNP水泵是卧式单级离心泵。

INP&LNP&GNP&SNP水泵结构在拆卸轴承部件时不需要从管道上拆卸泵体。
INP&LNP&GNP&SNP水泵适用于洁净或混浊，但不含固体物质的液体。
泵送颗粒大小不超过3mm，但会影响使用寿命。

4.3 Description 机械密封说明

Type 类型	Pump casing 泵体	Impeller material 叶轮材质	Sealing type 密封类型
Standard 标准	EN GJL 250 SS304 SS316 铸铁 304不锈钢 316不锈钢	EN GJL 250 铸铁	Mechanical seal EPDM 机械密封
Option 可供选择			Packing rings graphite + PTFE 填料密封 石墨+PTFE
		G-Cu Sn 10 青铜	Mechanical seal EPDM 机械密封
		SS304/SS316 304/316不锈钢	Mechanical seal VITON 机械密封

4.4 Example of long code 型号说明

LNP 125 - 400-45 / 4

Norm pump code 水泵系列号
Ø Discharge port(mm) 出口管径
Ø impeller (mm) 叶轮名义直径
Motor power (kW) 电机功率
2 or 4 poles 2 或 4 极

4.5 Shaft seal

Depending on the application, different shaft sealing executions are offered (see 4.3).

NOTE : Chapter 4.3 contains the codes for all variations of mechanical seals.

A stuffing box with lantern ring or mechanical seals according to UL778 are fitted in the following cases:

If the pump draws from a suction line, If the pump is fed by a feed line with a pressure of less than 0.5 bar or If the pumped liquid is at or near its boiling point.

4.5 轴封

根据应用可以提供不同的轴封。（详见表 4.3）。

注意：表 4.3 包含所有种类机械密封类型。

带轴套的填料密封符合 UL778 标准 安装条件如下：

水泵从吸入管线取水，水泵进水管压力小于 0.5bar 或泵送流体温度在沸点附近。

5. Planning the installation

5.1 Piping system

- Note the arrows on the pump branches indicating the direction of flow.
- Choose the nominal width of the pipelines in accordance with the nominal width of the pump branches or larger ones with the corresponding reductions.
- Flange sealing must not protrude on the inside.
- Ensure that the pipe work is clean before installing of the pump.
- Support the pipe work in order to avoid distortions at the pump components (risk of damage to pump components).
- Avoid abrupt changes of cross section and direction.
- Where different diameter pipe work is to be used, connection should be by eccentric transition pieces. This will avoid the formation of air pockets in the pipe work (fig. 2).
- For difficult pumping on the suction side, to stabilise the flow, a pipe length 15 times the diameter of the suction branch should be installed before the suction branch (fig. 2).
- The flow rate in the suction line or inflow line must not exceed 2 - 3 m/s.

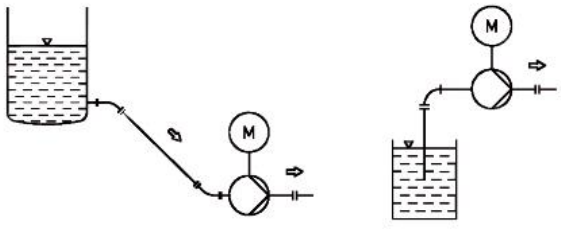
5. 安装

5.1 管道系统

- 注意水泵上标识的流动方向箭头。
- 根据水泵的名义管径来选择合适的管路管径。
- 法兰密封不允许在管内突出。
- 在安装水泵前确保管道清洁。
- 为防止水泵组件损坏，应对管道进行支撑（避免损坏水泵部件）。
- 避免突然改变管径和管路方向。
- 在水泵管径与管路系统管径不一致时，应通过异径管连接。可以防止气穴的产生（图 2）。
- 为了泵送流体稳定流动，水泵的进水端管路的长度应为水泵进口管径的 15 倍（图 2）。
- 进水管的流速不允许超过 2-3m/s.

5.1.1 Suction line

See the sketches below for the optimum layout of pump installation for flow and suction lift operation.



Pump under pressure　　Pump in suction

Fig.1　水泵负压　　水泵进口正压

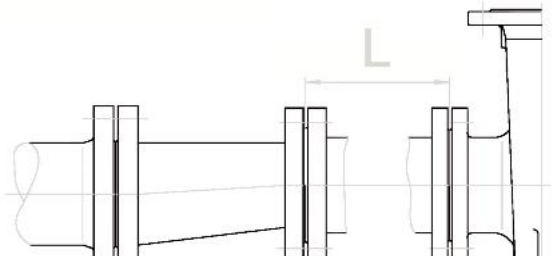


Fig.2

Ensure that air pockets cannot be created.

Unequal nominal widths of the suction branch and suction line must be compensated by eccentric transition pieces (fig. 2).

• It is recommended that a strainer is installed in front of the pump with a filter surface of at least 3

times the pipe cross section (approx. 100 meshes/cm2).

- The suction opening of the suction line should be well below the liquid level, and a strainer should be used.

The strainer must be far enough from the bottom to avoid excessive inlet losses, which could impair pumping performance. It is advisable to check that there is no leakage.

A shut-off valve should be installed in the feed line. It must be closed for maintenance work. It should be installed in order to avoid air pockets forming in the spindle cap, i.e. with the spindle in a horizontal position or pointing vertically downward.

5.1.1 进水管

下图是水泵最佳的进水口提升操作安装布置图。确保不产生气蚀现象。

水泵的进口管径与进口管路的管径不同时，必须在接管处加装异径管（图 2）。

建议在水泵进水口加装过滤器，过滤表面至少为管截面的 3 倍（大约 100 网孔/cm^2）进水管的吸入口应设在液面以下，且应加过滤器。

为防止过大的进口压力损失，影响水泵的性能，过滤器的安装必须远离底部。

建议对泄漏问题进行检查。

为防止产生气蚀，在进水管路应设截止阀。在进行维修时必须关闭。

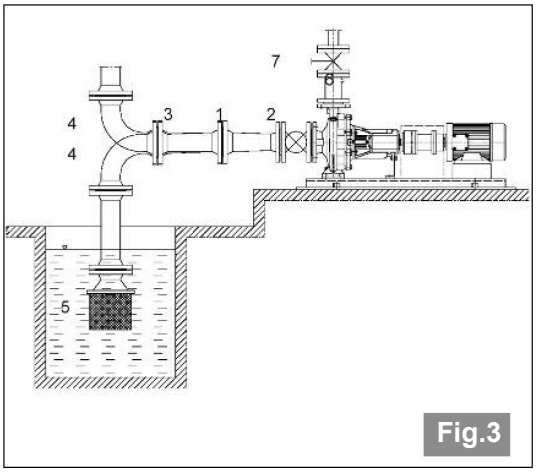


Fig.3

1 Eccentric reducer (suction) or concentric reducer (discharge) 异径管
2 Isolating valve 隔离阀
3 Suction line 进水管
4 Bend 弯头
5 Foot valve with strainer 带过滤器的底阀
6 Isolating valve 隔离阀
7 Regulating valve 调节阀

5.1.2 Discharge line

For flow regulation, a valve must be installed behind the pump. If non-return valves are used, they should close smoothly. Pressure shocks must be avoided.

5.1.2 出水管

为调节流量，在水泵出口必须安装调节阀。如安装止回阀，应可以自由关闭，防止水锤现象。

5.1.3 Inlet and outlet connections

The various connecting points are shows in the drawings. (See Annex, chapter 12, point 12.1).

5.1.3 进/出口连接

各部分连接请参见附件 12 章 12.1。

5.1.4 Pressure control

For consistent control of pressure, it is advisable to install in the pipe work a measuring point in

front of, and behind the pump.

5.1.4 压力控制

对压力控制，建议在水泵进口和出口的管路中安装测试点。

6. Unpacking, Storage, Handling

6.1 Safety measures

CAUTION !

- Never stay below the suspended load.
- Keep a safe distance while the load is being transported.
- Use only suitable slings, which are in good condition.
- Adjust the length of the slings in such a way that the pump and/ or the pumpset is suspended horizontally.
- Do not use the eyebolts on the pump components for lifting the assembled pump or the complete set.
- Do not remove documents, which are attached to the pump.
- Do not remove the protection covers from the pump suction/discharge. Otherwise, there may be a risk of contamination.

6.运输，存储，搬运

6.1 安全措施

警告！

- 禁止在悬吊重物下站立。
- 在搬运重物时与重物保持安全的距离。
- 仅可以使用处于良好状态的合适吊索。
- 泵头和整泵悬挂在水平位置时，调整吊索的长度。
- 起吊泵头或整泵不允许在水泵部件上使用吊环螺栓。
- 不要取下水泵附带的文件。
- 不要从水泵的进/出口处取下防护罩。否则，可能会造成污染。

6.2 Unpacking

Before unpacking, a visual check of the packing is recommended. If transport damage is visible, the extent should be noted on the receipt or on the delivery note. Potential claims must be lodged immediately with the carriers or the insurance company.

6.2 拆包装

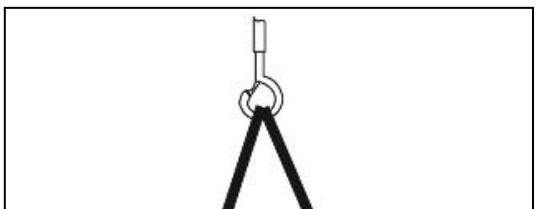
在拆包装前，建议对包装进行目测检验。如果运输中有损伤，损坏程度应标注在收据或交货单上。潜在的请求必须马上向运输者或保险公司提出。

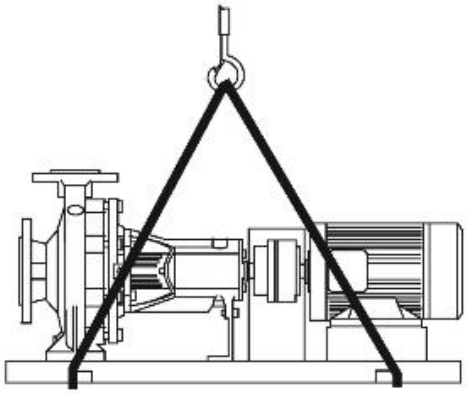
6.3 Temporary storage

If the pump or the pump unit is not installed immediately after delivery, it must be stored free from vibration in a dry room.

6.3 临时储存

如果泵头或整泵在运到后不马上进行安装，必须放置在干燥环境中储存，防止振动。





Bare shaft pump 泵头

Fig. 4a

Pump set 整泵

Fig. 4b

6.4 Handling

The pump or pump set must be lifted and handled as shown in the following sketches.

6.4 搬运

泵头或整泵必须按下图进行提升或搬运。

6.5 Protection against corrosion

A protective coating is applied to the pumps. Remove it before starting-up (see chapter 6.6).

6.5 防止腐蚀

水泵涂有防护涂层。在调试前清除防护涂层（详见6.6节）。

6.6 Removal of protective coating

To remove the protective coating, the pump should be filled and drained several times using appropriate agents, e.g. solvent naphtha, diesel oil or alkaline detergent. Flush with water, if necessary. The pump must be installed and started up immediately afterwards.

6.6 清除防护涂层

水泵应反复冲满和排放适当的试剂多次来清除防护涂层，试剂有溶剂油，柴油或弱碱性溶液。如有必要，用水冲洗。水泵必须安装且马上进行调试。

6.7 Renewing corrosion protection

If the pump has been supplied with a protective coating and has to be stored, a new protective coating should be applied after six months.

For suitable protective coatings, please contact us.

6.7 重新进行防腐处理

如果水泵涂有防护涂层且必需要储存，在 6 个月后应重新进行涂层处理。

如需进行涂层处理，请与我们联系。

7. Installing the pump

CAUTION! Installations and electrical connection must be made by authorised personnel according to the local standards!

WARNING!

Only appropriately authorised personnel may carry out this work.

WARNING!

Electrical connections must be made according to the European Regulations and Directives for the Standards in Industry and in compliance with the instructions of the local power supply utilities of the country concerned.

7. 安装

警告！根据当地的标准，安装和电气连接必须由授权人员来完成。

警告！只有适当的授权人员才能完成安装工作。

警告！电气连接必须遵守欧盟工业标准的法规和指令且符合当地的电力规范。？

7.1 Safety measures

- Remove the flange-obturators of the pump right before connecting piping.
- Connect the pipework carefully to prevent the pumped liquid escaping during operation and endangering operating personnel.
- Ensure that the suction or inflow line, and the discharge line are closed by valves.
- Ensure that all electrical connections are “dead”. Otherwise, there is a risk of electric shock.
- Pay attention to relevant internal plant regulations.
- Avoid accidental contacts with hot components.

CAUTION!

Remove the protective coating by following the instructions of chapter 6.6. Otherwise there is a danger of contamination.

7.1 安全措施

- 在安装管路前，拆下水泵的法兰密闭装置。
- 在操作过程中，认真连接管路，防止流体溢出，危及操作人员。
- 确保吸入口或进水管路，以及出水管路依靠阀门关闭。
- 确保所有电气连接是断开的。否则，有触电的危险。
- 注意相关的国内的法规。
- 避免意外触摸水泵的热部件。

警告！

根据6.6节的说明消除防护涂层。否则会产生污染。

7.2 General information 概述

7.2.1 Assembly tools 工具

Special tools are not required for assembly and installation.
组装和安装不要求特殊的工具。

7.2.2 Permissible ambient conditions

The ambient temperature can be from -20 °C to +40 °C. The atmospheric humidity should be as low as possible in order to avoid corrosion.

7.2.2 允许环境

环境温度为-20 °C ~ +40 °C。为防止腐蚀，空气的湿度尽可能低。

7.2.3 Base, foundation

The pump must be installed on a flat floor or foundation free from vibration. In case of doubt, use vibration dampening feet.
The pump set must be correctly mounted on the foundations. To avoid distortion of the pump set and/or the foundation, parallel shims must be used between the base plate and foundation.
Prior to installing, checks should be made with regard to:
- Possible damage to the pump or the pump set that may occur in transit.
- Ease of running (check that the shaft is free to rotate by hand).
- The foundation dimensions.

The following preparatory work must be carried out before to placing the pump:
- Roughen and clean foundation surface.
- Remove shuttering/cores from the anchor holes.
- Blow the anchor holes clean.
- Check the position and dimensions of the anchor holes against the arrangement drawing.

7.2.3 基础

水泵必须安装在平地或无振动的基础上。需使用减振器。
整泵必须正确地安装在基础上。为了防止泵体和基础变形，必须在基座和基础之间使用平衡垫片。
在进行安装前，应检查：
- 在运输中泵头或整泵可能会损坏。
- 简单的运转（用于旋转轴检查的自由旋转）。
- 基础尺寸。

在安装水泵之前必须完成下列的准备工作：
- 使基础表面粗糙且清洁基础表面。
- 从地脚螺栓孔处拆下底板。
- 清洁地脚螺栓孔。
- 根据图纸检查地脚螺栓孔的位置和尺寸。

7.2.4 Installation of the set

The complete set mounted on the base plate must be placed on the foundation with its foundation (rag) bolts hanging below the baseplate.

7.2.4 水泵的安装

整泵安装在基座上，必须用地脚螺栓装在基座上。

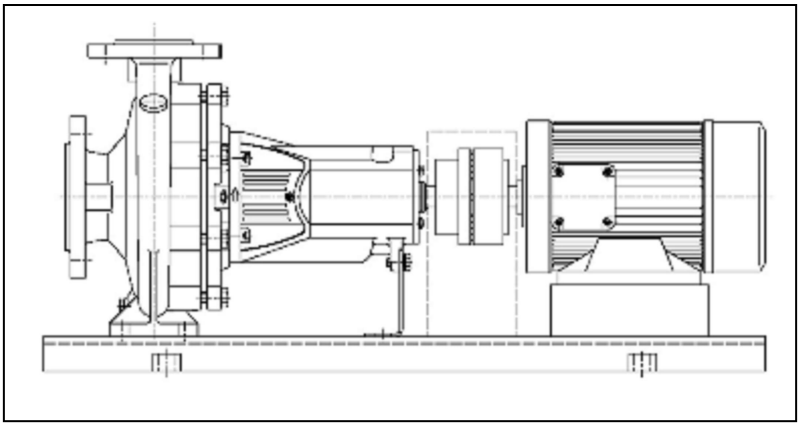
7.2.5 Space required

The space required for the pump set is set out in the foundation plan or installation drawing. Ensure easy access to the shut-off and regulation valves as well as to any measuring instruments.

7.2.5 安装空间

在水泵的安装图中标有安装空间。

确保截止阀和调节阀容易操作，也可以安装测量仪器。



7.2.6 Position

In principle the INP&LNP&GNP&SNP pumps are installed horizontally.

7.2.6 安装位置

原则上INP&LNP&GNP&SNP系列水泵水平安装。

7.3 Motor

Before assembly check the direction of rotation of the motor (indicated by an arrow on the pump casing). If this is not possible the direction of rotation of the complete unit can only be checked only if the pump is filled.

In any event, the operating instructions of the motor manufacturer must be followed, since the motor is generally incorporated by Coox into the pump set.

7.3 电机

在安装前，检查电机的旋转方向（在泵体上有标识的箭头）。如果水泵注满水，不可能检查整泵的旋转方向。

在任何情况下，必须遵守电机制造商的操作说明书，电机与水泵由克奥兹公司组合成整体。

7.4 Levelling the pumpset

Place shims under the base plate on both sides of the foundation bolts, 10 mm from the base plate edge. Use a spirit level to align the set.

If necessary, place shims between the foundation bolts to prevent the base plate from sagging. Care should be taken to minimize distortion of the base plate during installation. The location of the driver must not be higher than that of the pump. The max. deviation from the shaft centre line is ± 0.1 mm.

The foundation bolts should be embedded in concrete using quick-setting grout.

7.4 水泵的对中找正

基座下的地脚螺栓两面放置垫片，距基座边缘10mm。使用水平仪来调整对中水泵。

如果必要在地脚螺栓之间放垫片防止基座下陷。在安装过程中应注意将基础的损坏减到最小。电

机的位置不允许高于水泵。轴线的最大偏离度为±0.1mm。
地脚螺栓应使用快凝水泥嵌入到混凝土基础中。

7.5 Coupling

Install the coupling avoiding hard blows, if necessary warm them for an easier fitting.
Arrange the pump and motor on a level base. The shaft ends must be perfectly concentric. The distance between each half of the N-EUPEX B (FLENDER) coupling must be 2 - 3 mm.
If other manufacturers' couplings are used, follow the manufacturer's instructions. After installation on the foundation and connecting the pipework, the coupling alignment must be checked and realigned, if necessary. Moreover, after reaching the operating temperature the alignment of the coupling must be checked again.The coupling requires a guard that meets DIN 31001 in order to avoid accidental contact during operation.
In any event, the operating instructions of the coupling manufacturer must be followed, since the coupling is a component incorporated by Coox.
The following is required: a = a1 and b = b1

7.5 联轴节

如有必要为安装简单加热联轴节，为防止受力过猛，安装联轴节。使水泵和电机安装在一个水平底座上。轴端必须要同心。每半个联轴节间距需为2-3mm。
如果使用其他厂家的联轴节，遵守制造商使用说明，在安装基础和管路连接后，如有必要，联轴节需重新校对和对中。此外，在到达运行温度后，联轴节需重新对中。联轴节要求带防护装置防止在运行过程中发生意外。
在任何情况下，必须遵守联轴节的操作说明书，因为联轴节是克奥兹水泵的一部分配件。
下列要求：a=a1和b=b1

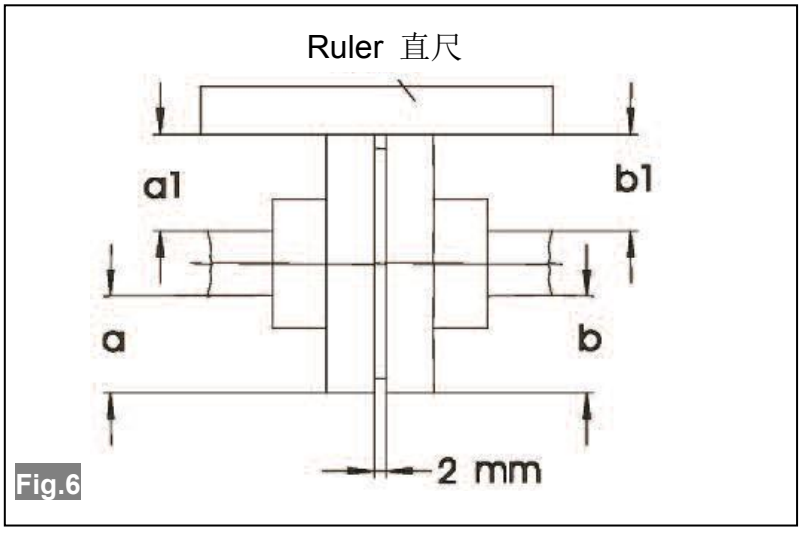


Fig.6

7.6 Checking before installation

Before installing the pump on the plant, the following points must be checked:
• Is the electrical current to the drive motor switched off?
• Are suction and discharge lines emptied and closed by valves?
• Is it possible to rotate the pump easily by hand (for this purpose turn the fan of the motor or the coupling)?

• Have the latest internal/plant instructions been observed?

7.6 安装前的检查

在水泵安装前应检查如下几点：

• 电机的开关是否关闭；

• 管路内的流体是否放空且阀门是否关闭？

• 是否可以用手不费力的旋转水泵？（转动电机的风扇或联轴节）

• 是否阅读最新的操作说明书？

7.7 Mounting the pump and installation into pipework

The following instructions must be carried out:

1. Remove the protective covers from the pump flanges and the auxiliary pipework connections.
2. Correctly insert the flange seals.
3. Connect the suction or feed line.
4. Connect the discharge line.

The pump must be aligned with the pipework. The pipework must be supported so that distortion cannot occur when connecting the pump.

7.7 水泵安装和管路安装

必须遵守下面的操作说明：

1. 从水泵法兰和配管连接拆下防护罩。
2. 正确的装上法兰密封。
3. 连接进水或给水管。
4. 连接出口管。

水泵必须与管路连接。在安装水泵时，禁止水泵支撑管路承受应力防止水泵变形，造成损坏。

7.8 Final work

The following final steps must be undertaken:

1. Check the tightness of the connecting flanges.
2. Check for easy running of the pump (for that purpose turn the motor fan or the coupling).
3. Check the coupling alignment.
4. Install the coupling guard.

7.8 最后工作

采取最后的步骤：

1. 检查接口法兰的紧固情况。
2. 检查水泵的转动（电机风扇或联轴节的转动）。
3. 检查联轴节对中。
4. 安装联轴节防护罩。

7.9 Hydrostatic pressure test

When subjecting the piping system to a hydrostatic pressure test, exclude the pump from the pressure test.

If it is not possible to test the pipework without the pump, ensure that foreign material cannot enter the pump.

NOTE: The max. Permissible pressure for a pressure test is 1.3 times the nominal pump

pressure.The nominal pump pressure is indicated in the technical data sheet.

7.9 水压测试

当管路系统易于进行水压测试时，不对水泵进行水压测试。

如果没有水泵是不可能测试管路的，保证异物不进入水泵。

注意：水压测试的最大允许压力是水泵公称压力的1.3倍。
公称压力在技术参数表中可查到。

8. Start-up and shut-down operations

8.1 Requirements

The pump or the pumpset must be installed in accordance with the recommendations listed in chapter 5.

8 起泵与停泵

8.1 要求

安装泵头或整泵必须遵守第5章的内容。

8.2 Use of trained staff

Only appropriately trained staff must carry out the work described in this chapter.

8.2 培训人员

培训人员仅须适当地完成此章节中描述的工作。

8.3 Safety measures

CAUTION!

- Electrical connections must be made according to the US Regulations and Directives for the Standards in Industry and in compliance with the instructions of the local power supply utilities of the country concerned.
- Only appropriately authorised personnel may carry out this work.

WARNING !

- Fill the pump correctly; otherwise the shaft seal could be destroyed.
- Fill the supply lines correctly.
- Check the direction of rotation only when the pump is filled.
- Fill the pump slowly if hot media are being pumped in order to avoid distortions or heat shock.
- When handling explosive, toxic, hot, crystalline or corrosive media, ensure that there is no risk to people or the environment.
- Control the output at constant speed at the discharge side only. The valve at the suction side must always be completely open during operation to avoid any risk of cavitation.
- If there is no bypass line, do not run the pump with the control valve closed for any length of time.
- Safety measures should be taken by the end user to ensure (for example by means of a relief valve) that the permissible pump casing pressure is not exceeded during operation.
- Repeat the alignment of the coupling at operating temperature. Re-align the pump or the motor, if necessary.

8.3 安全措施：

⚠ • 电气连接必须遵守欧盟标准、北美工业标准及当地的电力企业标准。？

• 只有授权人员才能完成这项工作。

⚠ • 水泵充水；否则损伤轴密封。

• 供水管道注水。
• 仅在水泵充满水时，检查水泵的旋转方向。
• 为防止水泵变形或受冲击，如果泵送热介质，慢慢将水泵充满。
• 在输送易爆炸的、有毒的、热的、结晶的或腐蚀性介质时，确保对人员或环境不造成损害。
• 仅在出口端恒速控制输出量，在运行过程中为防止发生气蚀，必须完全打开进水端的阀门。
• 如果没有旁通管，长时间关闭控制阀，不运行水泵。
• 最终用户应采取安全措施（例如设置安全阀）确保水泵在运行过程中泵体压力不超过允许的承压。
• 在运行温度下对联轴节再进行对中，如有必要，对水泵和电机进行轴对中。

8.4 Filling and venting the pump

Before the first use, the pump and its suction pipe must be full of liquid to avoid any dry running. The pump and the mechanical seal must be fully purged of gas.

⚠ **CAUTION!**

If the pump is purged of gas with a hot fluid, prevent any risk of burning by containing the leakages. In case of hot water, some steam can escape from the vent.

• Wear suitable clothes and protection such as gloves Please use also a face protector.
• Use pliers.
• Never touch the parts of the pump that can be hot.
• At the end of the purge, close tight the air vent.

⚠ **WARNING!**

Uncompleted gas purging can reduce significantly the lifetime of the pump.

8.4 水泵的充水和排气

水泵在最初使用之前，为防止水泵干转，必须将水泵和进水管充满液体。水泵和机械密封必须完全排气。

如果泵送热介质的水泵排气，防止泄漏造成烧伤的危险。如果泵送热水，蒸汽会从排气阀处排出。

• 穿防护服，戴手套和防护面具。
• 使用工具钳。
• 不要触摸水泵，可能会烫伤。
• 放气后，关紧排气阀。

⚠ 警告！

放气不完全可能会减少水泵的寿命。

8.5 Electrical connection

The motor must be connected at set out in the circuit diagram in the terminal box.

8.5 电气连接

电机必须在接线盒中按接线图接线。

8.6 Checks before switching-on

Before switching-on of pump, make sure that nobody can be endangered by this starting.

Before switching-on the pump unit, the following points should be checked:

1. Is all pipework connected and are the unions tight?
2. Has the shaft seal been installed?
3. Are the supply lines, if any, to the shaft seal open?
4. Is the coupling aligned exactly?
5. Is the pump including the pipework filled properly?
6. Is the shut-off valve in the discharge line closed?
7. Is the shut-off valve in the suction line completely opened?
8. Is the motor ready for operation?
9. Is the direction of rotation of the motor correct? (Check by running the motor for a short time)
10. Is the gland finger slightly tight?

8.6 开泵前检查：

在开水泵前，确保不会给任何人造成损伤。

在开泵前，应检查如下几点：

1. 所有管道是否连接，且管接头是否紧固？
2. 是否已安装轴封？
3. 供水管道，如有轴封，打开轴封？
4. 联轴节是否完全对中？
5. 水泵包括管道是否完全充满水？
6. 出水管上的截止阀是否关闭？
7. 进水管上的截止阀是否完全打开？
8. 电机是否做好运行的准备？
9. 电机的旋转方向是否正确？（瞬间检查运转的电机）
10. 密封套是否拧紧？

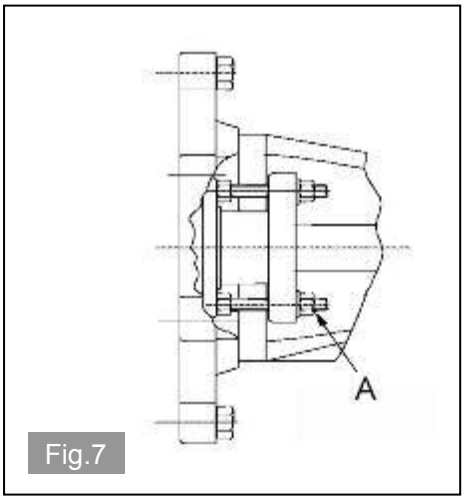


Fig.7

8.7 Start-up operation

For starting proceed as follows:

- Open fully the valve on the suction side.
- Close the valve on the discharge side.
- Switch on the motor.
- Check the pressure gauges at the pressure measuring points If the pumping pressure does not increase consistently with increasing speed, switch off the motor again and vent the pump one more.
- After reaching operating speed, regulate the operating point of the pump by adjusting the valve in the discharge line (see technical data for permissible range of operation).
- For “running in” the packing, the gland should be tightened only slightly (even in the case of considerable leakage initially). After approx. 30 minutes tighten the gland to such an extent that it leaks only slightly. Check it several times, until leakage from the packing is about 20 to 40 drops a minute. In extreme operating conditions and high temperatures this rate may be higher.

Pumping against a closed valve in the discharge line is permitted only if a minimum output via a bypass line is guaranteed.

If the installation is protected with a pressure relief valve, ensure that the pressure setting do not exceed the resistance of the pump casing. The alignment of the pump / motor must be checked when the functioning temperature is arisen.

8.7 启动

启动步骤如下：

- 完全打开进水端的阀门。
- 关闭出水端的阀门。
- 开电机。
- 如果电机的转速不断增大，水泵的压力不升高，再次关闭电机和重新对水泵放气，在压力测定点检查压力表。
- 在达到运转速度后通过调节出水管上的阀门，调整水泵的工作点。

（详见运行允许范围内的技术参数）

- 因为“试运转”，密封应稍稍拧紧些（假设在最初考虑泄漏问题）。大约30分钟后紧固密封，仅是轻微程度的泄漏。多次进行检查，直到泄漏在每分钟大约20~40滴。在极端运行条件和高温下这个速率可能很高。只有当通过旁通管道保证最小输出量，在出水管中允许使用隔离阀。如果安装真空减压阀，确保压力设定不能超过水泵泵体承受的压力。当运行温度升高时，必须重新检查水泵和电机的轴对中。

8.8 Special instructions

During operation the following points must be checked:

- Ensure that the pump runs without vibration.
- Control the liquid level in the suction line and/or inflow tank.
- Control the bearing temperature (max. temperature 100 °C).

Shaft seal

Execution with stuffing box:

For correct operation of the shaft seal a slight leakage (20 - 40 drops per minute) is essential. If the leakage is reduced too much by retightening the packing, the packing rings will be destroyed.

Execution with mechanical seal:

During running-in slight leakage may occur. If the pump is equipped with an external flush, quench or heating, the flush, quench or heating supply has to be switched on before the pump is started. The mechanical seal must be allowed to cool before the next re-start.

CAUTION!

For executions with stuffing box: If the leakage increases considerably and cannot be adjusted by retightening the gland, the packing is worn and must be replaced by a new one.

For executions with mechanical seal: If the initial leakage does not disappear within 5 minutes of operation, stop the pump, dismantle the seal and check for damage of the seal faces and auxiliary sealing.

8.9 特殊要求

在运行过程中，必须检查下列几点：

- 确保水泵运转不振动。

- 控制进水管或水池液面。
- 控制轴承温度。（最高温度100℃）

轴密封

填料密封：

轴密封的正常运行为每分钟20-40滴的轻微泄漏。如果通过拧紧密封圈来大量减少泄漏，填料环会损坏。

机械密封：

在调试过程中可能会出现轻微的泄漏，如果水泵配有外部冲洗、冷却或加热装置，在打开水泵前冲洗、冷却或加热装置必须打开。在下一次重新启动前机械密封必须要进行冷却。

⚠ **警告！**

填料密封：如果泄漏量相当大的增多，且不可能通过拧紧密封来调整，表明密封已经损伤，必须重新更换新的密封。

机械密封：如果在运行中最初的泄漏量在5分钟内不消失，水泵停止运转。拆下密封，检查密封面和辅助密封的损坏情况。

8.10 Shutting- down

Before shutting down close the valve on the discharge side.

After shutting down, all valves may be closed.

The valves of the auxiliary optional pipework connections, (quench, heating, external flush), have to be closed in the last place. If there is a risk of very low ambient temperatures, remove the pump and then drain it using the threaded plug.

⚠ **WARNING!**

When handling explosive, toxic, hot, crystalline or corrosive media, ensure that people and the environment are not endangered. Even if the pump has been drained using the threaded plug, residues can remain in the pump. For transport, the pump must be free from any dangerous material.

In case of extended periods out of service, protect the pump against corrosion.

8.10 关闭水泵

在关闭水泵前关闭出水管路上的阀门。在关闭水泵后，关闭所有的阀门。附加管路上的阀门（冷却、加热、外部冲洗），必须在最后关闭。如果环境温度很低，接近警戒温度，拆下水泵，然后拧开丝堵将水放空。

⚠ **警告！**

在输送爆炸性的、有毒的、热的、结晶的或腐蚀性介质时，确保人员和环境不会造成损害。即使拧开丝堵将水泵放空，残留物可能会留在水泵中。在运输中，水泵必须避免任何危险材料。

如果水泵长期没有进行维修，保护水泵防止水泵腐蚀。

9. Maintenance, dismantling, assembly　维护、拆卸、组装

9.1 Requirements　要求

The pump or the pump set must have been shut down in the manner described in chapter 8.10.

水泵或整泵必须按照8.10章中的内容关闭。

9.2 Use of trained staff

CAUTION! Only appropriately trained and skilled staff should undertake the work described in this chapter.

Only authorised personnel must undertake electrical work associated with maintenance of the pump/pump set.

9.2 人员培训

警告！只有经过培训和有经验的人员才能承担水泵的安装维护工作。

只有授权人员才能承担与水泵/整泵维护相关的电气工作。

9.3 Safety measures

WARNING!

- For explosive, toxic, hot, crystalline as well as different pumping media ensure that people and the environment are not endangered.
- Flush the pump with clean liquid before dismantling.
- The working place for disassembly or assembly must be clean.
- Before reinstallation, the pump must be free of any dangerous material.

9.3 安全须知

警告！

- 泵送爆炸性、有毒的、热的、结晶的以及其他介质时确保人员和环境避免受到损害。
- 在拆卸水泵前用清洁的液体冲洗水泵。
- 拆装水泵的地方必须干净。
- 在重新安装水泵前，水泵必须避免接触任何危险材料。

9.4 Maintenance and inspection

The pump requires only limited maintenance. However it is advised of:

- Check frequently if the pump turns freely without vibrations.
- Check driving alignment/pump frequently.
- Make sure every month that the mechanical seal does not leaking.
- Check every week the leak-flow of the gland packing.
- Please, refer to the motor instruction manual to be informed about the maintenance planning recommended by the manufacturer of this equipment. (Items to be checked, ball bearing lubrication schedule, and so on).

9.4 维护和检查

水泵要求必要的维护。维护须知：

- 经常检查是否水泵自由地运转，没有振动。
- 经常检查水泵和电机的轴对中情况。
- 每月检查，确保机械密封没有泄漏。
- 每星期检查填料密封的泄漏量。
- 电机的维护计划，请参照电机的操作使用手册。（检查项目、滚球轴承加润滑油维护等）。

10. Problems, causes and remedies　故障，故障原因及排除

⚠ **CAUTION!** Only appropriately trained personnel must undertake troubleshooting.

警告！只有经过培训的人员才能进行故障检修。

Problems　故障	Causes　原因	Remedies　排除
Output too low 水泵流量过低	Back pressure too high 过高的负压	Check the plant for contamination. Regulate anew the operating point 检查水泵中的杂质。 重新调整运行工况点
	Pump or pipework, not completely filled 水泵或管道没有完全注满介质	Vent and fill the pump as well as the suction or inflow line 放空或注满水泵及吸入口或管道
	Suction lift too high or positive suction head too low 吸升高度过高或吸入高压头过低	Check the liquid level; open the shut-off valves on the suction side. Clean the filters 检查液位；打开进口端的截止阀。清洗过滤器。
	Impeller sealing gap too large 叶轮密封间隙太大	Replace worn parts 更换损坏部件
	Wrong direction of rotation 旋转方向错误	Change the motor connection 调换电机接线
Pump does not prime or only intermittently 水泵没有准备好启动或只是间断地运转	Pump casing, shaft seal, foot valve or suction line leaks 泵体，轴封，底阀或吸入管泄漏	Replace the casing seal. Check the shaft seal. Check the flange connections 更换套管密封件。检查法兰连接。
	Suction lift too high or positive suction head too low. 吸升高度过高或吸入压头过低	Check the liquid level; open the shut-off valves on the suction side. Clean the filters on the suction side 检查液位；打开进口端的截止阀。清洗进口端的过滤器。
	Loose or jammed parts in the pump 水泵中的部件松动或被卡住	Open and clean the pump 打开且清洗水泵
Pump leaks 水泵发生泄漏	Casing bolts not correctly tightened 泵体螺栓没有拧紧。	Check the tightening torque of the casing bolts 检查泵体螺栓的紧固力矩。
	Mechanical seal leaks 机械密封泄漏	Check the seal surfaces and rubber material of the mechanical seal. In case of damages exchange mechanical seal 检查密封面和机械密封的橡胶材料。如果被损坏，更换机械密封。
Temperature of the	Pump or pipework not	Vent and fill the pump as well as the

pump increases 水泵的温度升高	completely filled 水泵或管道没有完全注满介质。	suction line or inflow line 放空或注满水泵及吸收入管或管道
	Suction lift too high or positive suction head too low 吸升高度过高或吸入压头过低	Check the liquid level; open the shut-off valves on the suction side. Clean the filters on the suction side 检查液位；打开进口端的截止阀。清洗进口端的过滤器。
	Pump is run against closed valve 阀门关闭，水泵运转	Open the shut-off valve on discharge side 打开出口端的截止阀
Noisy pump 水泵产生噪音	Pump or pipework not completely filled 水泵或管道没有完全注满介质	Purge of air the pump and the pipework 空气吹扫水泵和管道
	Suction lift too high or positive suction head too low 吸升高度过高或吸入压头过低	Check the liquid level; open the shut-off valves on the suction side. Clean the filters on the suction side 检查液位；打开进口端的截止阀。清洗进口端的过滤器。
	Pump is not properly levelled or is distorted 水泵不水平或有变形	Check the pump levelling and alignment 检查水泵水平和轴对中
	Foreign material in the pump 水泵中有异物	Dismantle and clean the pump 拆开水泵且清洗水泵
The motor contactor trips 电机接触器跳闸	Pump is not properly levelled or is distorted 水泵不水平或有变形	Check the pump levelling and alignment 检查水泵水平和轴对中
	Earth fault 接地错误	Check the earth connection. Check the potential causes such as damaged wirings or cables, leakages on electrical parts 检查地线连接。检查潜在的原因。例如配线或电缆损坏，电气部件漏电。
	Operating conditions outside of performance range of pump 运行条件在水泵要求的性能之外	Refer to pump operating conditions stated in technical data 参考技术参数中的水泵运行条件
	Loose or jammed parts in the pump 水泵的部件松动或被卡住	Open and clean the pump 打开水泵和清洗水泵

11. Technical data

All the technical data of the pump or pump/unit are described in the following chapter. If other information were necessary, do not hesitate to contact our technical department.

11. 技术参数

水泵的所有技术参数在下面的章节介绍。如有其他要求，请与我们的技术部门联系。

Pressure component operating limits　高压构件极限工作条件

Material 材质	Temperature 温度	Pressure 承压
Body cast iron with impeller cast iron or impeller bronzes or impeller SS 泵体铸铁 铸铁叶轮、青铜叶轮或不锈钢叶轮	-20ºC to 120℃	25bar
		16bar

Shaft sealing operating limits
轴封极限工作条件

Shaft sealing execution　轴 封	Temperature limits　温度范围
Packing ring seal 填料密封	-40°C to +110°C
Mechanical seal 机械密封	-20°C to +120°C

NOTE: All indicated operating limits are not valid for all liquids, which can be pumped. See technical data or delivery note.

注意：推定的极限工作条件不适于所有泵送的液体，详见技术参数表或供货说明。

Flange locations 法兰位置

Axial suction flange, discharge flange radialy upwards.
轴向进口法兰，出口法兰（向上）。

Direction of rotation　旋转方向

Clockwise seen from the drive end of the pump.
从电机端看，水泵为顺时针方向旋转。

Materials of construction, and of shaft seals　构件和轴封材质

See chapter 4.　详见第4章。

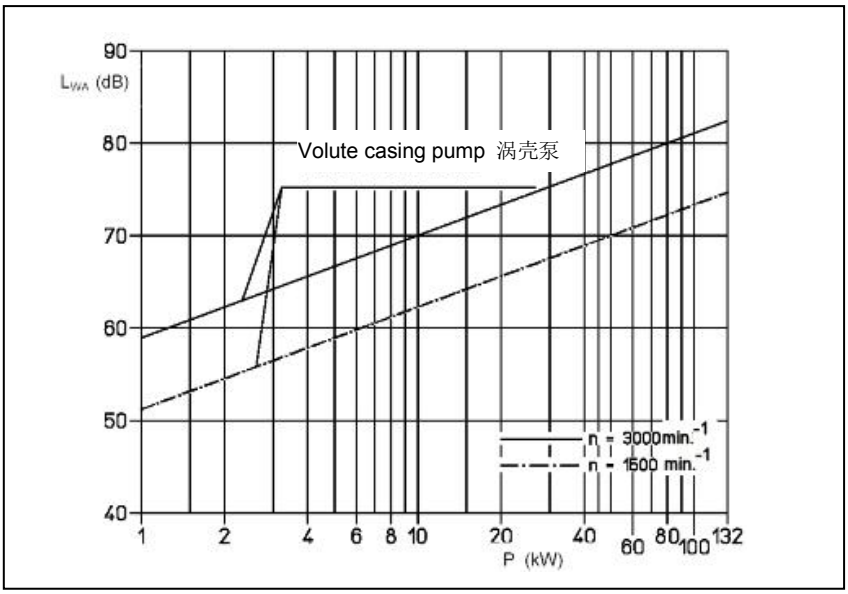
Vibrations 振 动

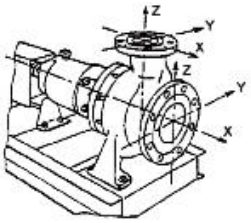
INP&LNP&GNP&SNP range pumps comply with UL778 and ISO 5199 Class K for pumps with a driving power of up to 15 kW and Class M with a driving power of more than 15 kW.

INP&LNP&GNP&SNP系列水泵符合UL778和ISO 5199标准电机功率≤15 kW 振动达到K级标准，电机功率>15 kW 振动达到 M 级标准。

Noise level 噪声级

The noise levels of the pump comply with the UL778 of the USPUMP Commission.
水泵的噪声级符合UL778标准。
The following table provides approximate values:
下表为所提供的近似值：





Pump without motor

Note that additional noise can be generated by:
• The driver.
• A possible misalignment of the coupling.
• Pipework (note: the larger the pipe diameter, the lower the pipe noise.

泵头（不带电机）

注意附加噪声可能由下列原因引起：
• 电机。
• 联轴节没有轴对中。
• 管道（注意：管道直径越大，管道噪声越小）。

Permissible branch forces and moments

Frames without grouting for pumping
temperatures up to 110 ºC and up to 120ºC for cast iron baseplate / frames.

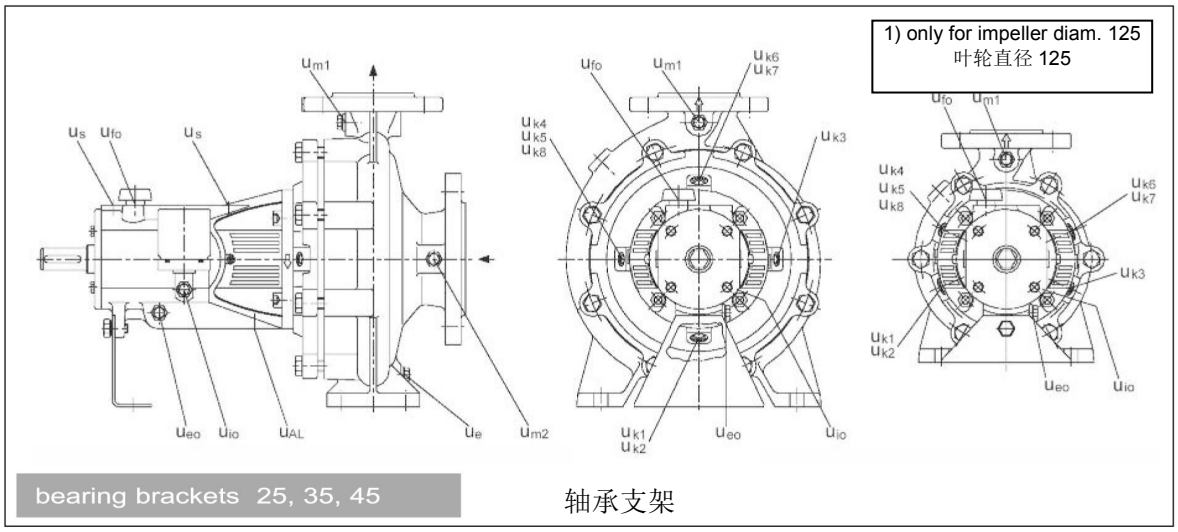
法兰允许承受的力和力矩

水泵安装在铸铁底座上，介质温度可达110℃，非水泥框架。温度达120℃，铸铁底座/框架。

	DN	flange	Fy (N)	Fz (N)	F (N)	TMF (N)	My Nm)	Mz(Nm)	TMMx(Nm)
Top branch Z axis z 轴方向	32	400	500	440	780	360	420	520	760
	40	400	500	440	780	360	420	520	760
	50	540	660	600	1040	400	460	560	820
	65	80	1000	900	1580	460	520	640	940
	80	820	1000	900	1580	460	520	640	940
	100	1080	1340	1200	2100	500	580	700	1040
	125	1620	2000	1800	3140	700	820	1000	1460
	150	1620	2000	1800	3140	700	820	1000	1460
	200	2160	2680	2400	4180	920	1060	1300	1920
	250	2700	3340	2980	5220	1260	1460	1780	2620
	300	3220	4000	3580	6260	1720	1980	2420	3560
Top branch X axis X 轴方向	50	600	540	660	1040	400	460	560	820
	65	900	820	1000	1580	460	520	640	940
	80	900	820	1000	1580	460	520	640	940
	100	1200	1080	1340	2100	500	580	700	1040
	125	1800	1620	2000	3140	700	820	1000	1460
	150	1800	1620	2000	310	700	820	1000	1460
	200	2400	2160	2680	4180	920	1060	1300	1920
	250	2980	2700	3340	5220	1260	1460	1780	2620
	300	3580	3220	4000	6260	1720	1980	2420	3560
	350	4180	3760	4660	7300	2200	2540	3100	4560

12. Annex 附件

12.1 Optionals connections



12.1 部件连接

um1 : Pressure gauge. Only available on request 压力表接口，需按要求配置

um2 : Pressure gauge. Only available on request 压力表接口，需按要求配置

ue : Drainage 泄水
ueo : Oil drainage 泄油
uio : Constant level oiler (CLO) 油封室
ufo : Oil filling 注油孔
uAL : Drainage for leakage. Threaded hole only available on request
泄漏排放，按要求配置螺纹孔。
us : Sensor 传感器
uk1 : Quench Inlet 冷却水进口
uk2 : Heating Inlet 热水进口
uk3 : 051 inlet (Stuffing box) 051进水口（填料盒）
uk4 : 052 (External sealing) –Stuffing box 052（外密封）—填料盒
uk5 : Flushing externe 冲洗外部
uk6 : Quench outlet 冷却水出口
uk7 : Heating Outlet 热水出口
uk8 : 051 Outlet (Stuffing box) 051出水口（填料盒）

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Chinese-English slab

数据仅供参考，如有修改，恕不通知
Data are only for reference and notice won't be offered when any alteration is made

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