

杭州碱泵有限公司
HANGZHOU ALKALI PUMP CO.,LTD.
 浙江华泵科技有限公司
HB PUMP CO., LTD.

销售部电话: 0571-89905601/89905603
 销售部传真: 0571-89905602
 E-mail:sales@hbgroups.com
<http://www.hbgroups.com>
 地址: 杭州市三墩镇西湖科技园西园五路12号
 邮编: 310030

International Clients
 Tel:+86 571 89900102
 Fax:+86 571 89905602
 E-mail: overseas@hbgroups.com
<http://www.hbgroups.com>
 Add:No.12 Xiyuan 5 Road, Westlake Science & Technology
 Zone, Sandun Town, Hangzhou
 Post code: 310030

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HJD[®] 系列化工用多级单吸离心泵

HJD Series Single Suction Multistage Chemical Centrifugal Pump

参照ISO9905、API610、API682标准
 Conform to ISO9905 / API610 / API682 Standard

输送介质温度-40°C~175°C
 Operation temperature -40°C~175°C

挠性联轴器传动
 Flexible coupling

最大工作压力15.0MPa
 Max working pressure 15.0MPa



Since 1958

化工用多级单吸离心泵

Single Suction Multistage Chemical Centrifugal Pump

主要应用于 Application

- | | |
|---|--|
| <input checked="" type="checkbox"/> 石油化工 | <input checked="" type="checkbox"/> petrochemical industry |
| <input checked="" type="checkbox"/> 工业供水 | <input checked="" type="checkbox"/> industrial water supply |
| <input checked="" type="checkbox"/> 环境保护 | <input checked="" type="checkbox"/> environment protection |
| <input checked="" type="checkbox"/> 电厂 | <input checked="" type="checkbox"/> power plant |
| <input checked="" type="checkbox"/> 冷却或加热系统 | <input checked="" type="checkbox"/> cooling or heating system |
| <input checked="" type="checkbox"/> 冶金和化肥 | <input checked="" type="checkbox"/> metallurgical industry and chemical fertilizer |

用法 Usage

HJD系列两端支承径向剖分化工多级离心泵被设计用于输送无颗粒的各类洁净或带悬浮物的介质，尤其适用于输送有腐蚀、无研磨物质的液体，符合ISO9905标准。

HJD series radially split type multi-stage chemical centrifugal pump with supports at both ends is designed to convey various kinds of clean medium free from particle or medium with suspended solids. It is suitable for conveying corrosive liquid without grinded materials in particular. It satisfies the requirements of ISO9905 standard.

| | | |
|-----------------------|------------|-------------------|
| 法兰标准 Flange standard | EN 1092-1 | ASME/ANSI B16.5 |
| 公称压力 Nominal pressure | PN40/PN100 | Class300/Class900 |

材料 Material

与介质接触的过流部件，材料符合ASTM标准，常用材料如下：

- 不锈钢
- 铸钛
- 哈氏合金

For flow passage components contacting with medium, their materials shall conform to ASTM standard. Materials which are usually used are as follows:

- Stainless steel
- Cast titanium
- Hastelloy

泵型号说明 Pump model description

HJD 25-66X5-L

安装形式 Mount type
从电机端看进口方向：
L-左(水平)进，上(垂直)出
R-右(水平)进，上(垂直)出
U-上进上出
L-inlet(horizontal) at LH, outlet(vertical) at upper side
R-inlet(horizontal) at RH, outlet(vertical) at upper side
U-inlet at upper side, outlet at upper side

级数 Number of stages

单级扬程 Single-stage water head

流量 Flow rate

泵系列代号 Serial No. of pump

泵运行数据
Operating data

流量 (3~800) m³/h
扬程 (100~1100) m
温度 (-40~175) °C

Flow rate (3~800)m³/h
Total heads (100~1100)m
Operating temperature (-40~175)°C

现场标准条件
Standard conditions
at site

- 连续运行过程中的相对湿度不大于90%
- 环境温度不高于40°C，不低于4°C
- 海拔高度不超过1000m

- Relative humidity during continuous operation max. 90%
- Ambient temperature max.40°C, min.4°C
- Permissible altitude up to 1000m above sea level

当当地条件与上述规定不符时必须加以说明。

Deviations from the site conditions specified herein must already be disclosed in the inquiry.

流量
Flow rate

化工多级泵的允许运行范围取决于：

- 转速
- 振动
- 介质特性
- 轴承及轴的载荷
- 泵壳的散热及材料的抗腐蚀性
- 工况进口净压头与泵汽蚀余量

The permissible operating range of centrifugal pumps depends on :

- Speed
- Vibration
- Medium characteristics
- Bearing and shaft load
- Heat dissipation particularly with regard to insulated volute casings and the corrosion resistance of materials
- The net positive suction head of the working condition and NPSH

适用工作范围在性能曲线和泵数据表中表示。

The operating range applicable to the pump is indicated in the individual characteristic curves and the pump data sheet.

出口压力
Outlet pressure

化工多级泵的出口压力取决于：

- 泵入口压力
- 选定叶轮直径的最大总扬程
- 泵送介质的密度

The pump outlet pressure at the outlet nozzle depends on:

- The pump inlet pressure
- The maximum total head of the selected impeller diameter
- The density of the medium to be pumped

最大泵出口压力P2max op计算公式如下：

$$P2max\ op = P1max\ ip + \rho * g * H * 10^{-5}$$

P2max op为最大出口压力(bar)
P1max ip为最大进口压力(bar)
ρ为泵送介质密度(kg/m³/h)
g为引力常数(m/s²)
H为允许最小流量下的最大总扬程(m)

泵选择和运行必须确保泵出口最大压力绝不能超过工作温度下泵体最大允许工作压力。这也适用于排放阀关闭时的调试。

The maximum pump outlet pressure P2max op is calculated using the formula:

$$P2max\ op = P1max\ ip + \rho * g * H * 10^{-5}$$

P2max op = maximum pump outlet pressure(bar)
P1max ip = maximum pump inlet pressure(bar)
ρ = density of the medium to be pumped(kg/m³)
g = gravitation constant(m/s²)
H = minimum allowed flow capacity at max head(m)

Pumps must be selected and operated in a way which ensures that the maximum pump outlet pressure does by no means exceed the maximum permissible operating pressure of the casing pall wc at operating temperature. This also applies to commissioning while the diacharge vavle is closed.

压力和温度限制
Pressure and
temperature
limitations

壳体最大工作压力取决于工作温度

The maximum casing operating pressure pall wc of the casing depends on the operating temperature:

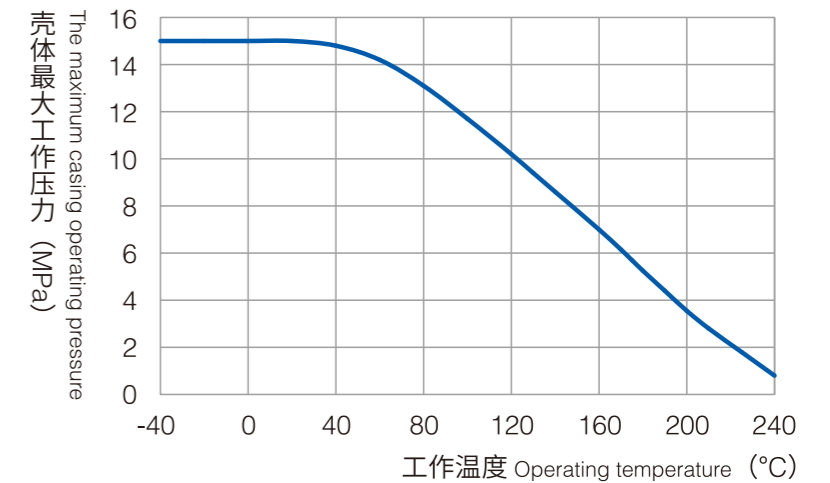


图1：壳体最大允许工作压力

Fig.1: maximum permissible casing operating pressure pall wc.

**转速和
叶轮直径限制**
Speed and
impeller diameter
limitations

泵轴运行速度不能超过叶轮最大允许圆周速度，这相当于60m/s。

The operating speed of the pump shaft must not exceed the maximum permissible peripheral speed of the impeller, which corresponds to 60m/s.

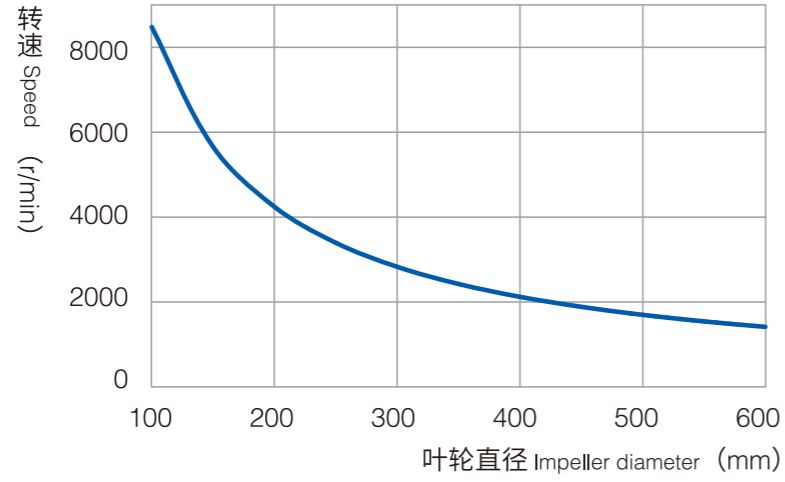


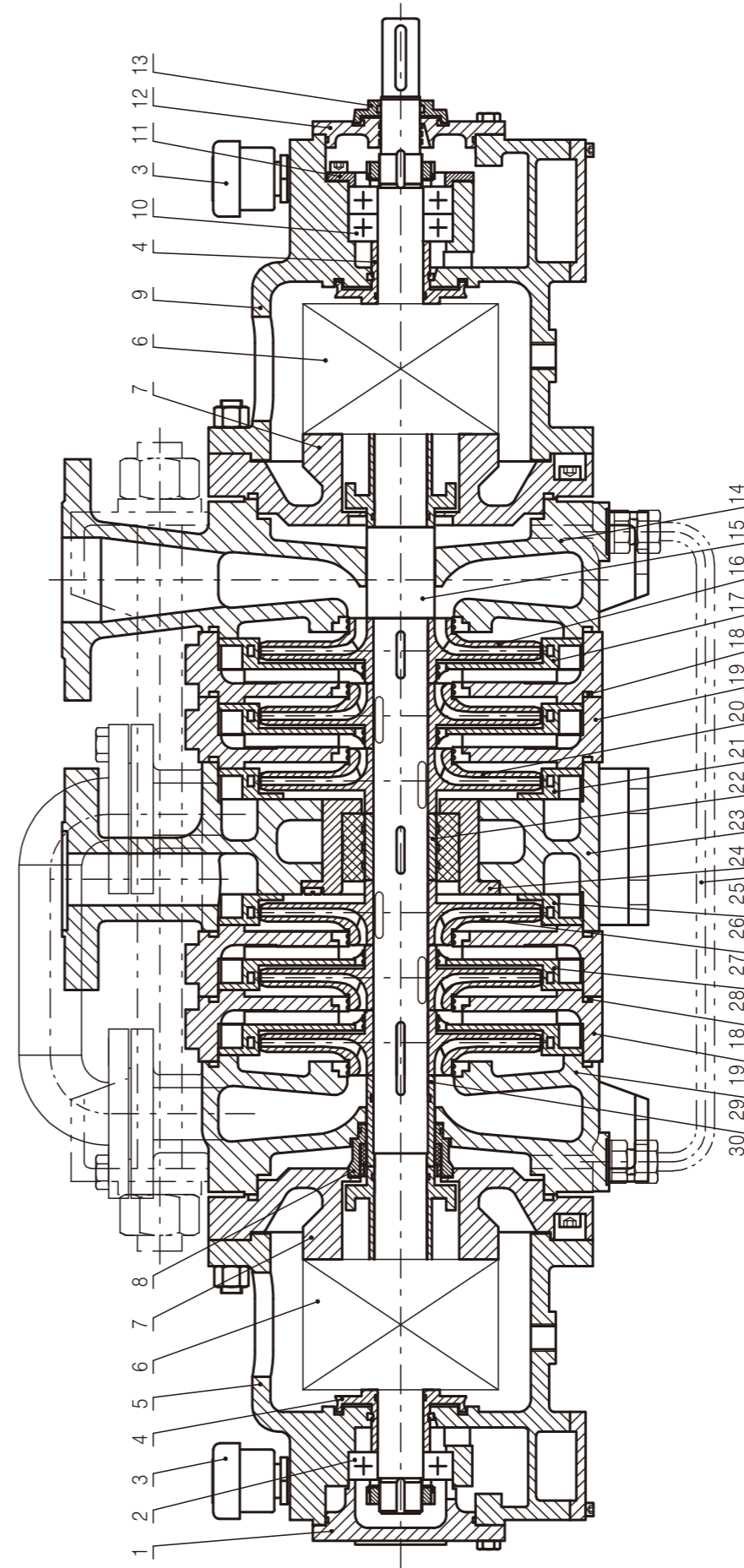
图2: 最大允许泵轴运行速度

Fig.2: maximum permissible shaft speed

泵的结构 Pump Structure

HJD系列化工泵是一种单吸、多级、节段式、卧式径向剖分、两端支承、叶轮对称布置的化工离心泵。技术要求符合ISO9905标准。

HJD series chemical pump is a horizontal, sectional and radially split type multistage chemical centrifugal pump featured by single suction, both-end supports and symmetric arrangement of impeller. Its technical requirements conform to ISO9905 standard.



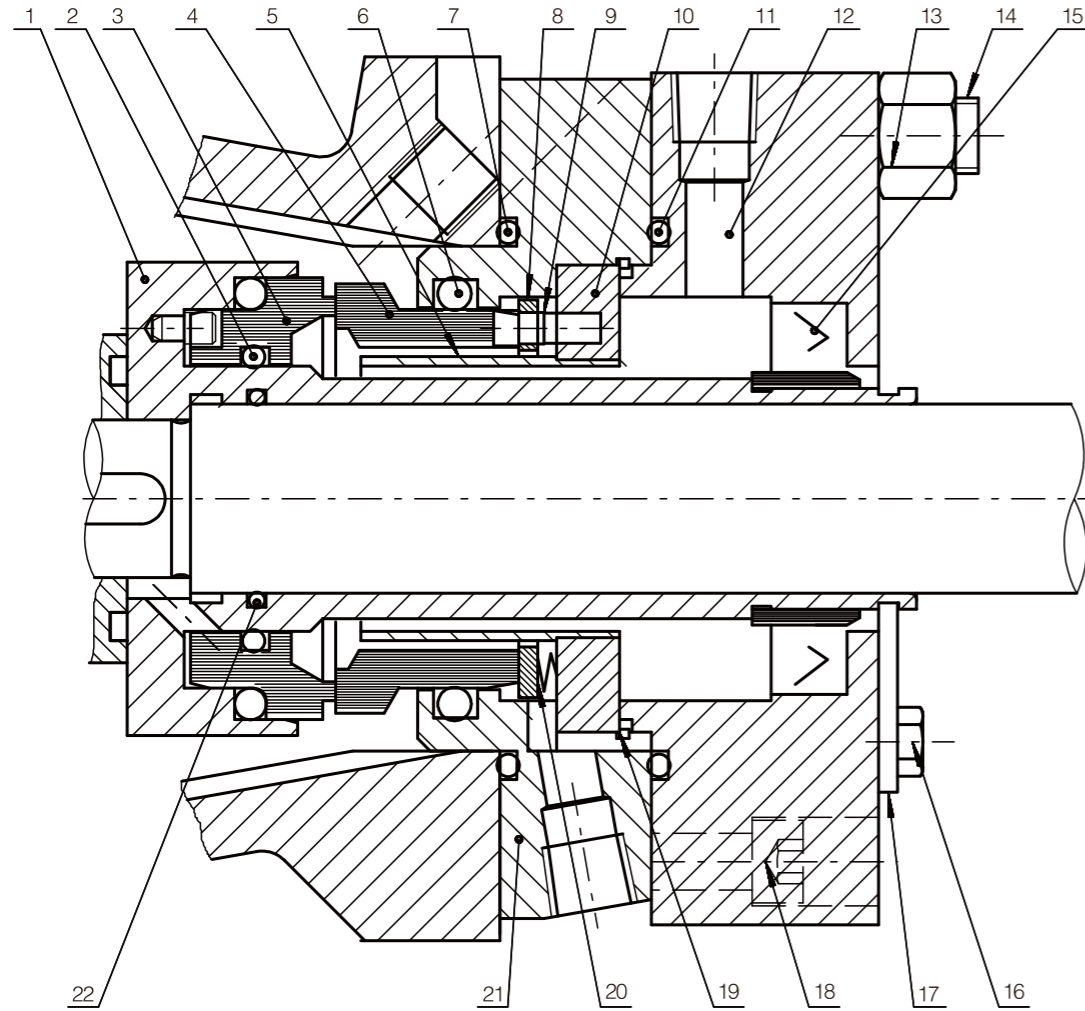
- 1 出口端轴承压盖 / Bearing cap at outlet end
- 2 前轴承 / Front bearing
- 3 气孔盖 / Air vent cover
- 4 挡水盘 / Water retaining plate
- 5 出口端轴承架 / Bearing stand at outlet end
- 6 机械密封 / Mechanical seal
- 7 机封箱体 / Mechanical seal housing
- 8 节流衬套 / Throttle bushing
- 9 进口端轴承架 / Bearing cap at inlet end
- 10 后轴承 / Rear bearing

- 11 轴承挡环 / Retainer ring of bearing
- 12 进口端轴承压盖 / Bearing gland at inlet end
- 13 防尘盘 / Dustproof disk
- 14 进口段 / Inlet section
- 15 轴 / Shaft
- 16 首级叶轮 / 1st stage impeller
- 17 导叶 / Guide vane
- 18 O型圈 / O ring
- 19 中段壳体 / Intermediate housing
- 20 次级叶轮 / Second stage impeller

- 21 末级导叶 / Ultimate vane
- 22 滑动轴承 / Sliding bearing
- 23 出口段 / Outlet section
- 24 滑动轴承套 / Sliding bearing sleeve
- 25 平衡管 / Equalizing pipe
- 26 反末级导叶 / Ultimate reverse vane
- 27 反次级叶轮 / Second stage reverse impeller
- 28 反导叶 / Reverse vane
- 29 次级进口段 / Second stage inlet section
- 30 阻封轴套 / Sealing bush

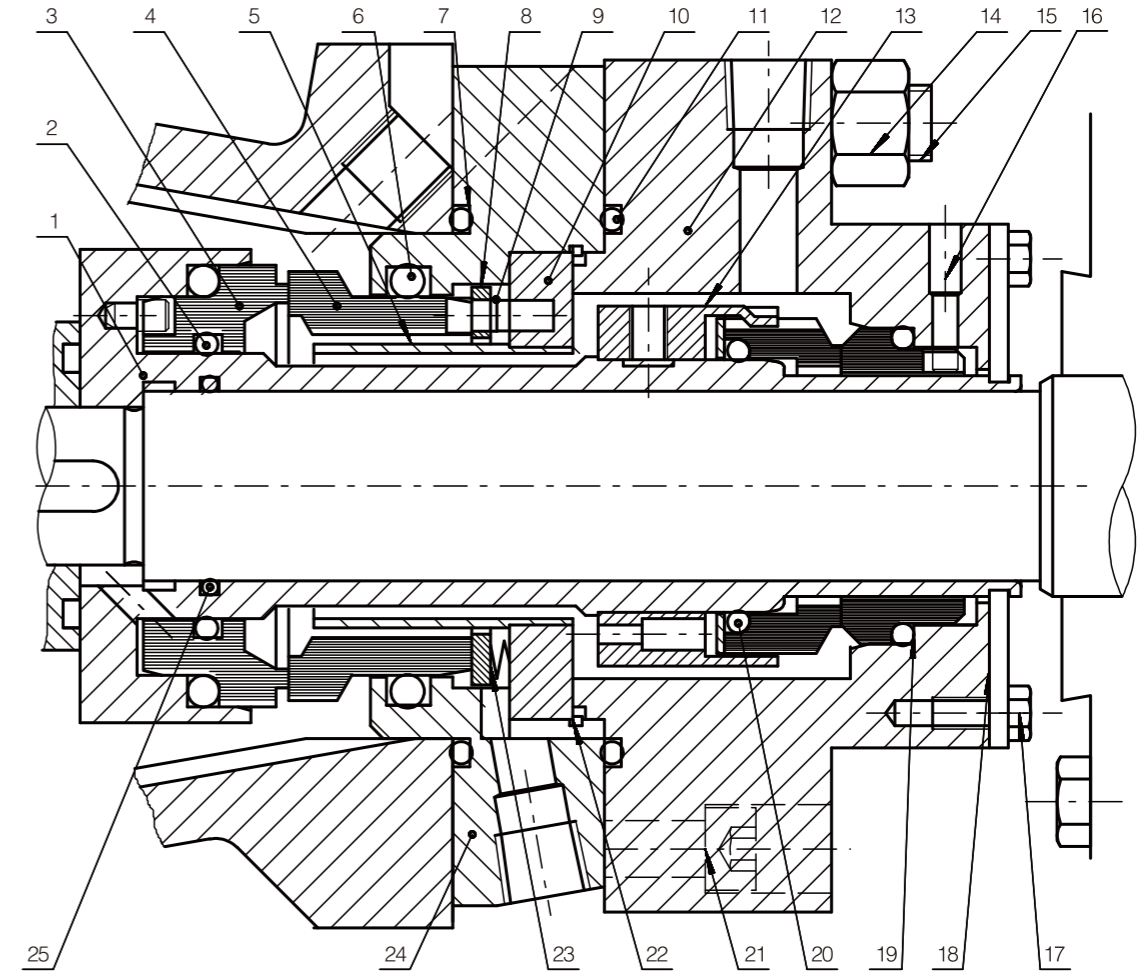
泵的轴封有本公司专利产品171C、171C/H75机封供用户选择。也可配用按照API682标准设计的品牌机械密封。

For pump sealing, our company's patent products e.g. 171C and 171C/H75 mechanical seals are ready for clients to choose. Branded mechanical seals designed in accordance with API 682 standard can also be used.



■ 171C

- | | |
|------------------------|--------------------------------|
| 1 机封轴套 / shaft sleeve | 12 静环压盖 / Gland of static ring |
| 2 O型圈 / O ring | 13 螺母 / Nut |
| 3 动环 / Dynamic ring | 14 螺柱 / Stud |
| 4 静环 / Static ring | 15 油封 / Oil seal |
| 5 冷却套 / Cooling sleeve | 16 螺栓 / Bolt |
| 6 O型圈 / O ring | 17 偏心挡板 / Centrifugal baffle |
| 7 O型圈 / O ring | 18 内六角螺栓 / Inner hexagon bolt |
| 8 推环 / Thrust ring | 19 卡环 / Clasp |
| 9 防转销 / Stop pin | 20 弹簧 / Spring |
| 10 弹簧座 / Spring seat | 21 前压盖 / Front gland |
| 11 O型圈 / O ring | 22 O型圈 / O ring |



■ 171C/H75

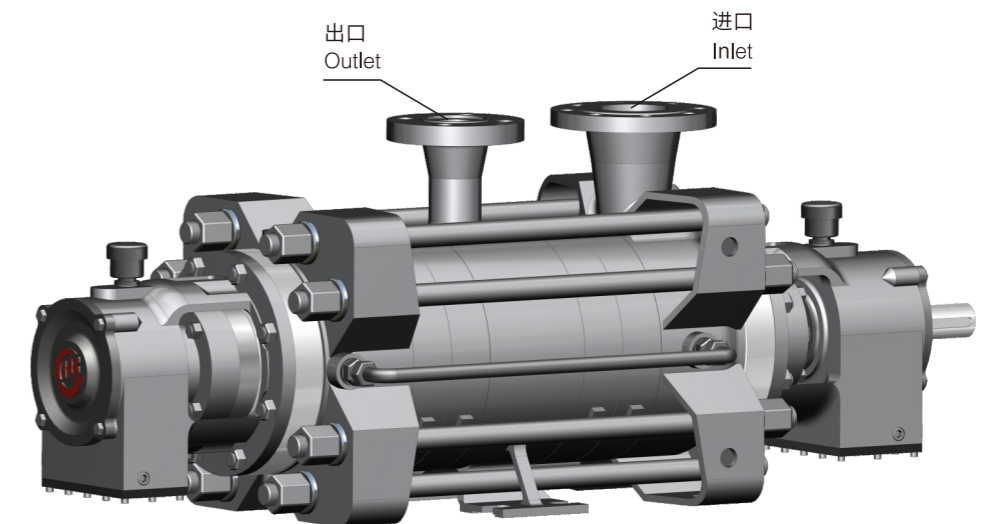
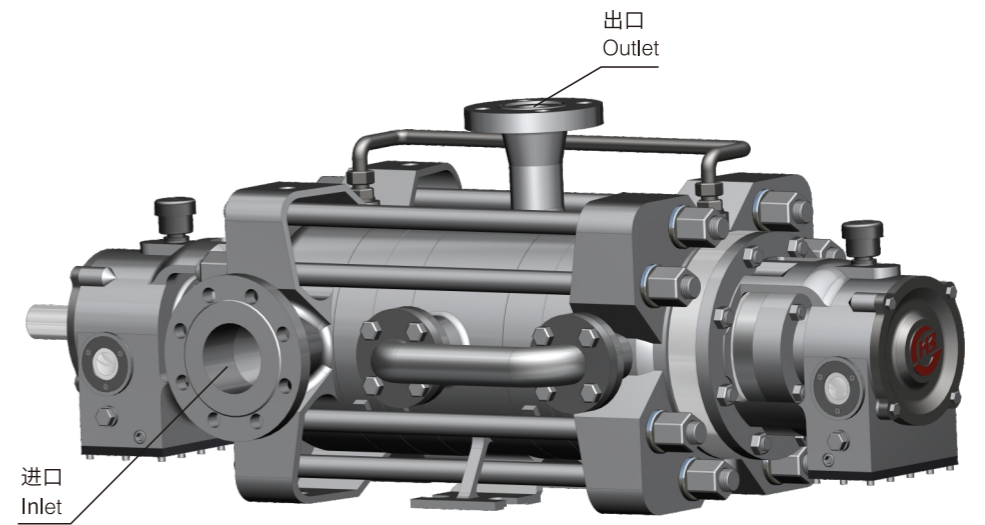
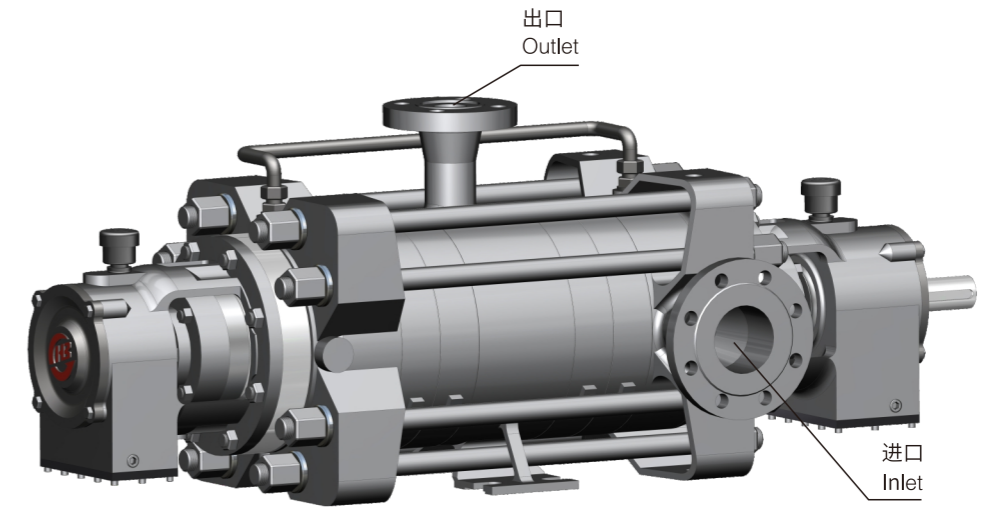
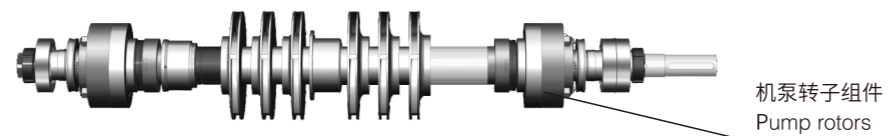
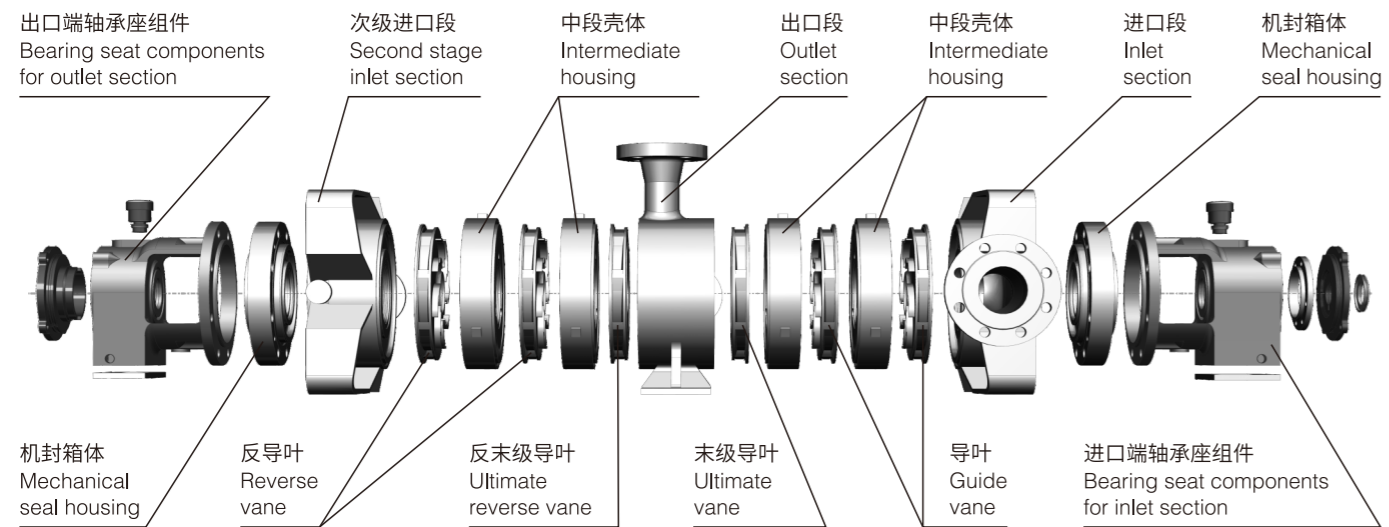
- | | |
|-------------------------------------|-------------------------------|
| 1 机封轴套 / shaft sleeve | 14 螺母 / Nut |
| 2 O型圈 / O ring | 15 螺柱 / Stud |
| 3 动环 / dynamic ring | 16 防转销 / Stop pin |
| 4 静环 / Static ring | 17 螺栓 / bolt |
| 5 冷却套 / Cooling sleeve | 18 偏心挡板 / Centrifugal baffle |
| 6 O型圈 / O ring | 19 O型圈 / O ring |
| 7 O型圈 / O ring | 20 O型圈 / O ring |
| 8 推环 / Thrust ring | 21 内六角螺栓 / Inner hexagon bolt |
| 9 防转销 / Stop pin | 22 卡环 / Clasp |
| 10 弹簧座 / Spring seat | 23 弹簧 / Spring |
| 11 O型圈 / O ring | 24 前压盖 / Front gland |
| 12 机封压盖 / Gland for mechanical seal | 25 O型圈 / O ring |
| 13 机械密封 / Mechanical seal | |

结构优化设计，操作安全性高 维修方便，使用寿命长

*Optimized structure design, high operation safety
easy maintenance and long service life*

产品零件高度互换，降低用户备件库存。

Product spare parts are highly replaceable, so that the users' stock of spare parts will be reduced.

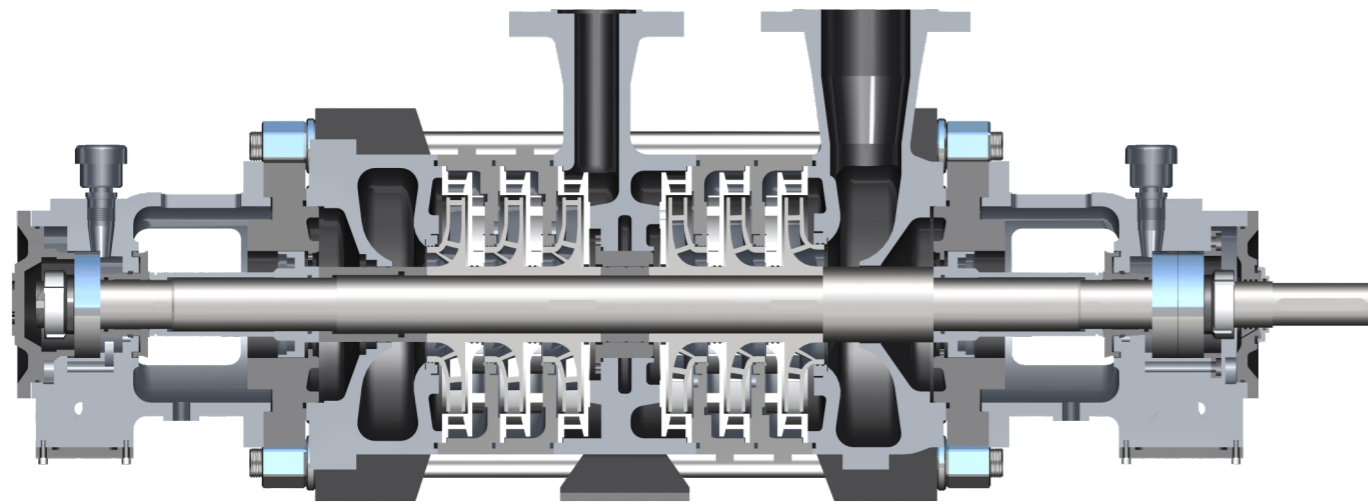


进口布置方式有L(左)、R(右)、U(上)，灵活可变，无需更换进出口段，满足不同用户需要。

Different kinds of inlet arrangement such as L(LH), R(RH) and U (Upper) are available, so that customers' requirements can be satisfied without changing the inlet section and outlet section.

结构优化设计，操作安全性高
维修方便，使用寿命长

Optimized structure design, high operation safety
easy maintenance and long service life



对称式叶轮布置，基本消除轴向力，提高轴承、机封使用寿命。

Symmetric impeller arrangement will basically eliminate the axial force and extend the service life of bearing and mechanical seal.

首级叶轮特殊设计，提高泵的抗汽蚀性能。

The special design of first stage impeller will improve the anti-cavitation performance of the pump.

不同水力模型布置，增加高效点设计，保证全系列高效率，使用范围大，降低运行成本。

Different hydraulic model arrangement increases the efficiency of point design, ensures the high efficiency of full series and large scope of use and reduces the operation cost.

加粗重型轴，提高承载能力及运行稳定性，降低维修费用及运行成本。

Oversized heavy shaft will enhance bearing capacity and operation stability and reduce maintenance cost and operation cost.

大空间轴承箱及油池，水冷风冷两种形式，降低润滑油温升，延长轴承寿命。

Spacial bearing container and oil tank as well as water cooling and air cooling will reduce the temperature rise of lubricant and extend the service life of bearing.

复合迷宫轴承保护，彻底解决轴承箱漏油问题，防止水和灰尘进入，提高轴承使用寿命，运行更可靠。

Composite labyrinth bearing protection will thoroughly solve the oil leakage problem of bearing box, prevent water and dust from entering, improve the service life of bearing and make operation more reliable.

直锥型吸水室，速度场均匀，水力损失小，降低水头损失，提高效率。

Straight cone type suction chamber is even in velocity field, small in hydraulic loss, so as to reduce the head loss and improve efficiency.

平衡集装箱式机械密封，无需调整压缩量，改善冲洗、冷却、润滑条件，延长机封使用寿命。

Balanced cartridge mechanical seal, it is unnecessary to adjust the shrinkage, flushing, cooling and lubrication conditions will be improved and service life of mechanical seal will be extended.

机封加热冷却可变，输送介质适应性广，提高通用性。

The general use of mechanical seal will be enhanced since It is adjustable between mechanical heating or cooling and wide application of conveying medium.

合同试验， 保证泵性能的满足

本公司依据合同和标准执行以下测试：

静水压试验

试验基于常温清水，压力为基本设计压力的1.5倍，保压10分钟。

性能试验

依据ISO9906标准测量，试验精度II类，验收类2B。

NPSH试验

依据ISO5199标准测量。

振动试验

依据ISO5199进行振动试验，泵的振动烈度级别控制在B级。

温度测量

在工作温度下，对轴承温升进行测量，测量的结果记录在案。

材料检验

零部件材质检验，铸件无损检测，保证整机可靠性。

Test to be carried out according to the contract to ensure the performance of the pump satisfies the contractual requirement.

Our company will carry out following test in accordance with the contract and standard.

Hydrostatic pressure test

The test will be carried out based on clean water under normal temperature. The pressure will be 1.5 times of design pressure and the pressure will be held for 10 min.

Performance test

Measure in accordance with ISO 9906. The test accuracy will be category II and acceptance category will be 2B.

NPSH test

Measure in accordance with ISO5199.

Vibration test

Carry out vibration test in accordance with ISO5199 and the vibration severity of pump will be controlled at level B.

Temperature test

Measure the temperature rise of bearing under working temperature and the result will be recorded.

Material inspection

Spare parts shall go through material quality inspection and cast shall go through NDE to guarantee the reliability of the integral machine.



订货须知

Notice to Order

(一) 配用电机的额定输出功率与泵的额定轴功率之比应按照下列的百分数：

| 轴功率 | 百分比% | The shaft power of the pump | the ratio (%) |
|-----------|------|-----------------------------|---------------|
| 22kW以下 | 125% | Below 22kW | 125% |
| (22~75)kW | 115% | (22-75)kW | 115% |
| 75kW以上 | 115% | Above 75kW | 115% |

(二) 订货时按《泵工作条件》详细填写。

When ordering, please fill in the table "Working conditions of the pump".

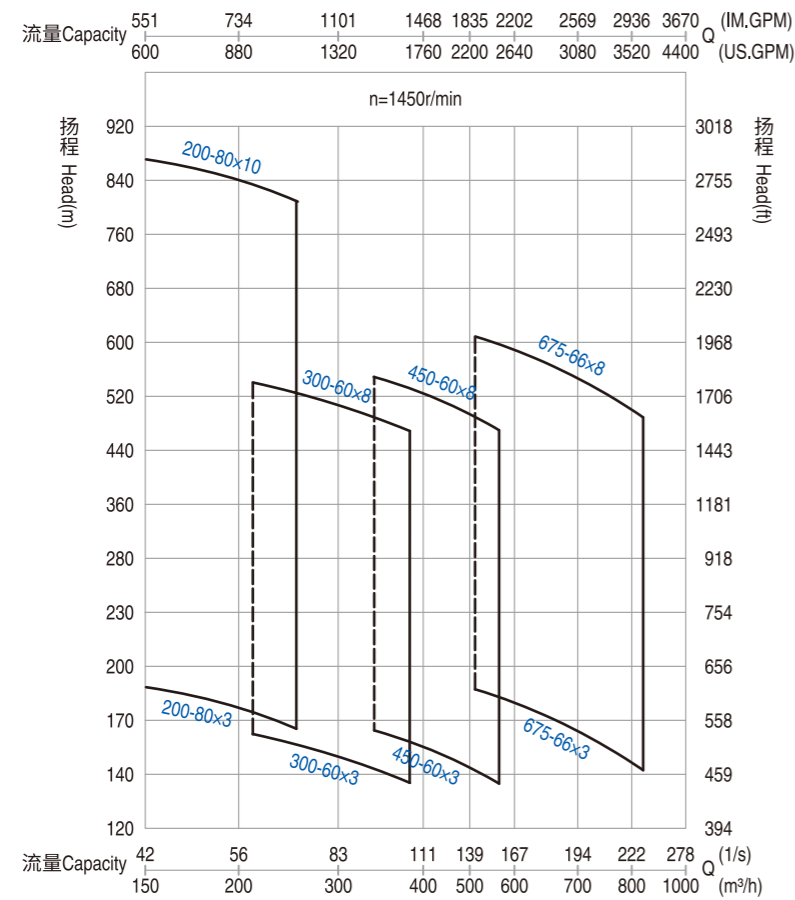
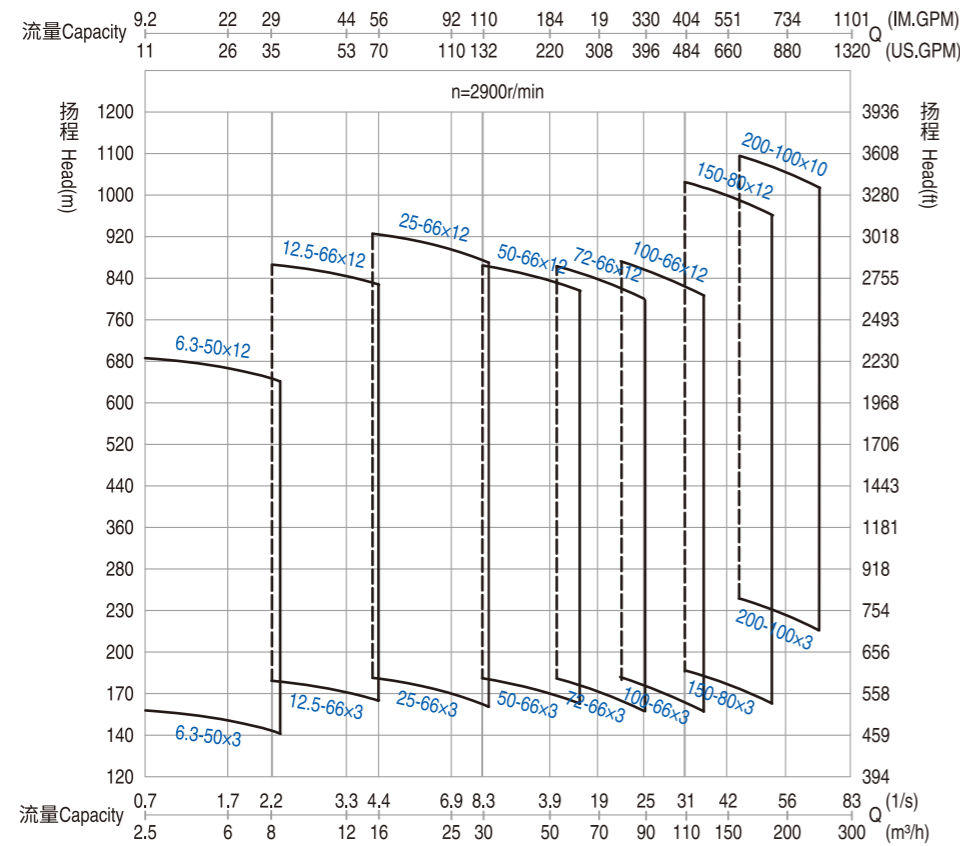
(三) 保修条款只有在使用本公司原厂备件时才有法律效力。

Warranty is valid only when genuine spare parts of our company are used.

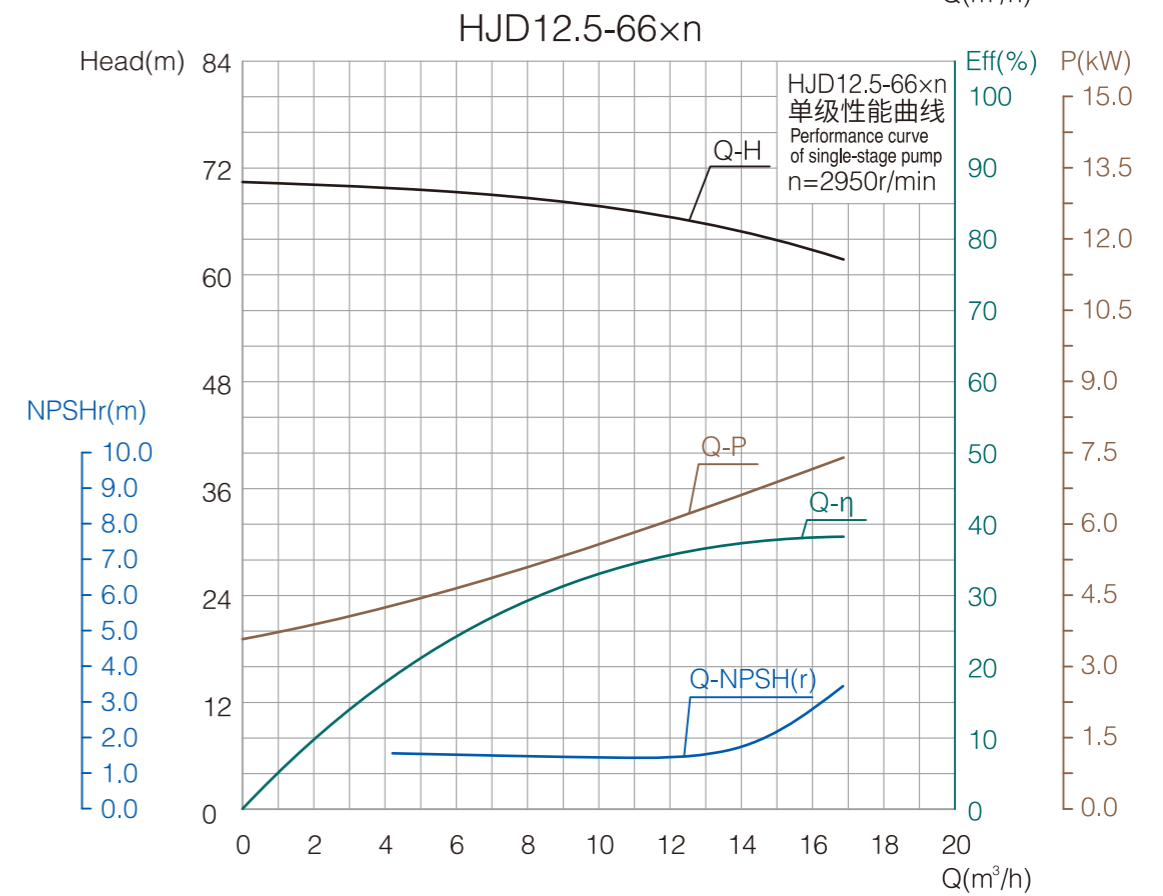
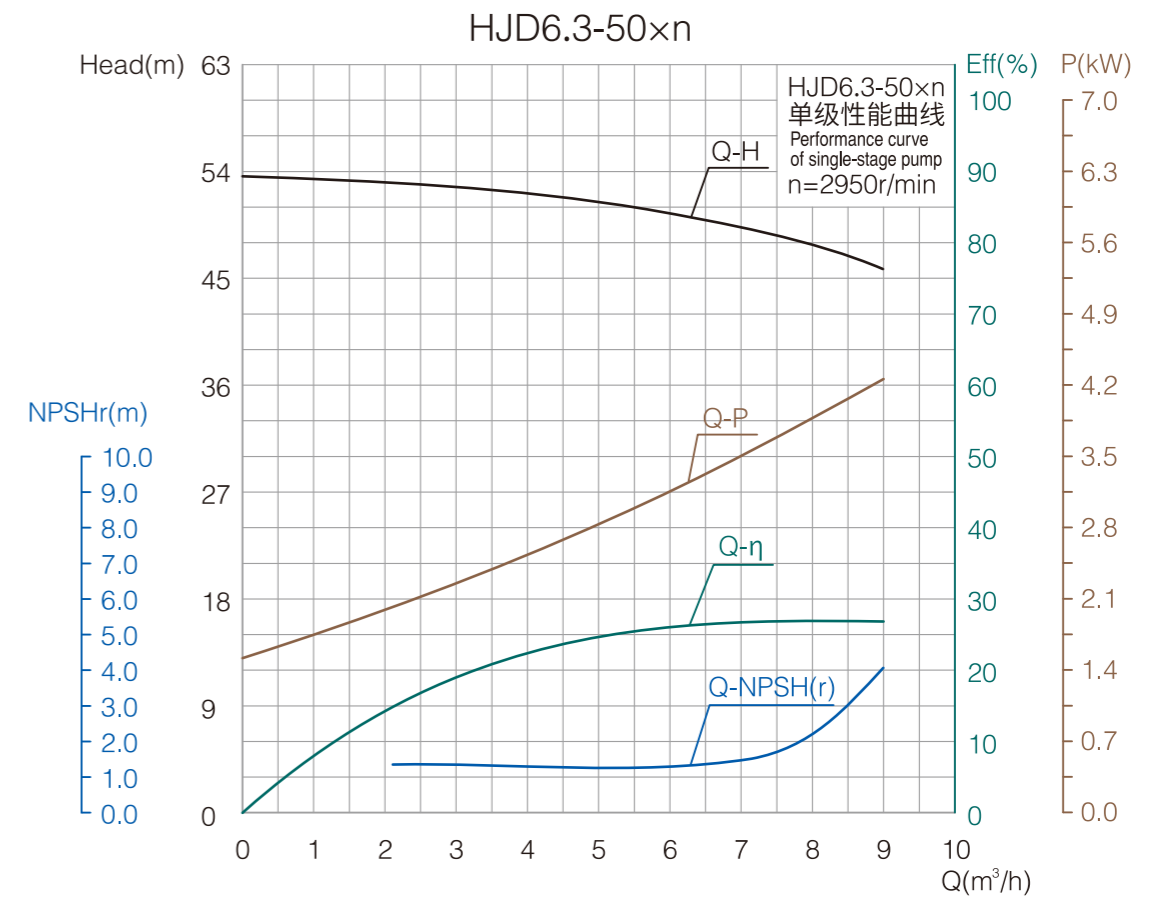
泵工作条件 Working Conditions of the Pump

| 工作条件 Operating conditions | | | | 输送介质 Pumped fluid | | | | | |
|--|---------------------------------|-----------------------|--------------------|----------------------------------|---------------------------------------|------------------------------------|--|--------------|-----------|
| 流量 Capacity | m ³ /h | 最大 Max | 额定 Rated | 最小 Min | 介质 1 Media | 最大比例 Max ratio | 最小比例 Min ratio | % | |
| 扬程 Total head | m | 最大 Max | 额定 Rated | 最小 Min | 介质 2 Media | 最大比例 Max ratio | 最小比例 Min ratio | % | |
| 进口压力 Suction pressure | MPa | 最大 Max | 额定 Rated | 最小 Min | 介质 3 Media | 最大比例 Max ratio | 最小比例 Min ratio | % | |
| 出口压力 Discharge pressure | MPa | 最大 Max | 额定 Rated | 最小 Min | 固体 Solid | 含量 (湿基) Content (humidity) Wt % | | | |
| 必需汽蚀余量 NPSH required | m | | | | | 粒度直径 Particle diameter mm | | | |
| 操作条件 Operating conditions | 连续 Continuous | | 间断 Intermittent | | 介质特性 Medium characteristics | 腐蚀 Corrosion | 磨(冲)蚀 Abrasion | | |
| 现场资料和公用事业条件 Spot conditions | | | | | 泵送温度 Operation temp | °C | 最大 Max | 正常 Normal | 最小 Min |
| 位置 Position | | | | | 密度 Density | | 在操作温度下 Under operating temp kg/m ³ | | |
| 室内 Indoor | 有采暖 With heating | 有遮棚 With shield | | 粘度 Viscosity | 在操作温度下 Under operating temp mPa.s | | | | |
| 室外 Outdoor | 无采暖 Without heating | 无遮棚 Without shield | | 汽化压力 Vapor pressure | 在操作温度下 Under operating temp MPa(A) | | | | |
| 必须的防寒气候条件 Requirement of Cold-proof | | | | | 比热 Specific heat | kcal/kg°C | | | |
| 必须的耐湿热气候条件 Requirement of Damp-heat-proof | | | | | 氯化物浓度 Concentration of chloride | PPM | | | |
| 现场资料 Site condition | | | | | H2S(硫化氢)浓度 Concentration of H2S | PPM | | | |
| 海拔高度 Altitude | m | | | 危险程度 Hazardous liquid | 易燃 Flammable | 易爆 Explosive | 有毒 Toxic | | |
| 大气压力 Atmosphere pressure | kPa | | | 挥发特性 Volatile characteristics | 易 Easy | 不易 Not easy | | | |
| 相对湿度 Relative humidity | 最大 Max | 最小 Min | % | 沸点 Boiling point | °C | | | | |
| 环境温度范围 Ambient temp. Range | °C | | | 结晶温度 Crystallization temp | °C | | | | |
| 异常条件 Abnormal conditions | 粉尘 Dust | 烟雾 Smoking | | 熔点 Smelting point | °C | | | | |
| 危险区域 Electrical classification | 类 Class | 级 Division | 组 Group | 闪点 Point of flammability | °C | | | | |
| 电源 Power source | 伏特 Volt | 赫兹 Hz | 相 Phase | 相溶的液体 Compatible liquid | | | | | |
| 冷却水 Cooling water | 温度 Temp | °C | | 压力 Pressure | MPa | 相溶的橡胶 Compatible rubber | | | |
| | 氯化物浓度 Chloride concentration | | | PPM | 临界温度 Critical temp °C | | | | |
| 仪表压缩空气 Compressed air of instrument | 最大/最小压力 Max / Min. Pressure | | | /MPa | 临界压力 Critical pressure MPa | | | | |
| 传动方式 Driving way | | | | | 其它 Other | | | | |
| 联轴器 Coupling type | | | | | | | | | |

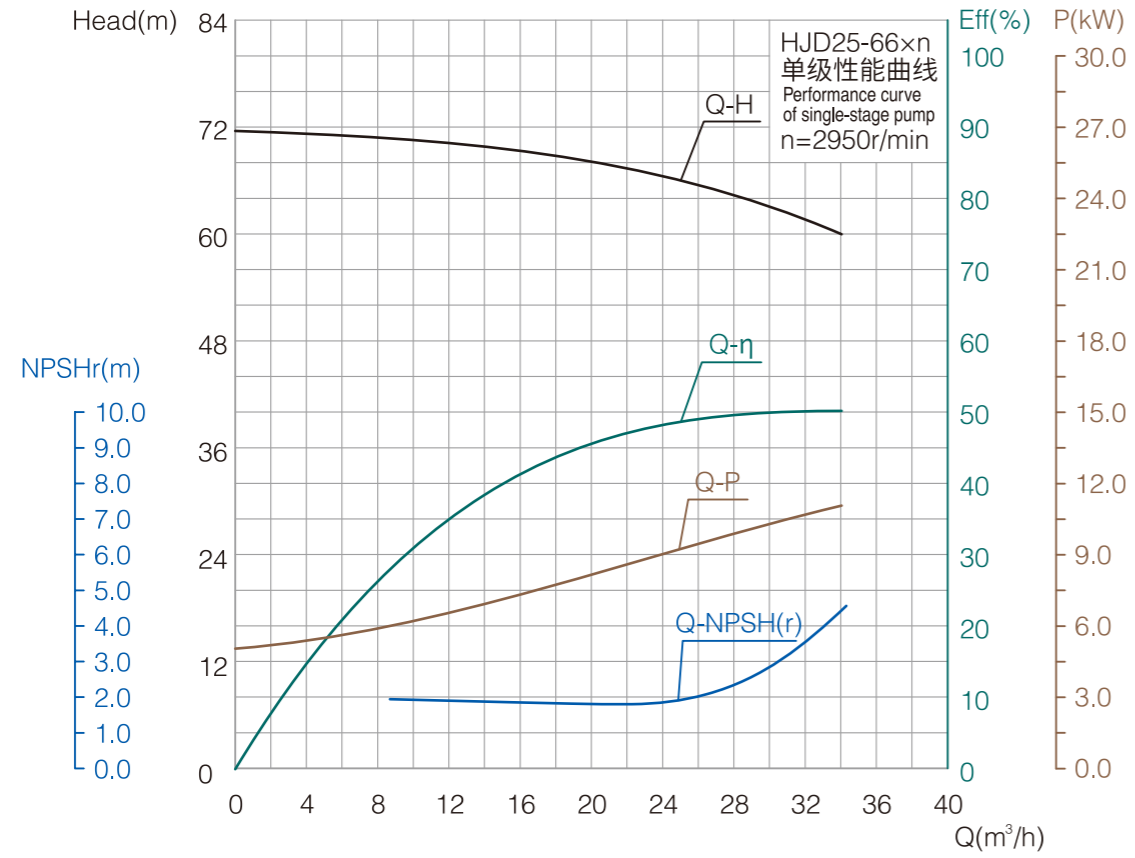
性能范围 Performance Range



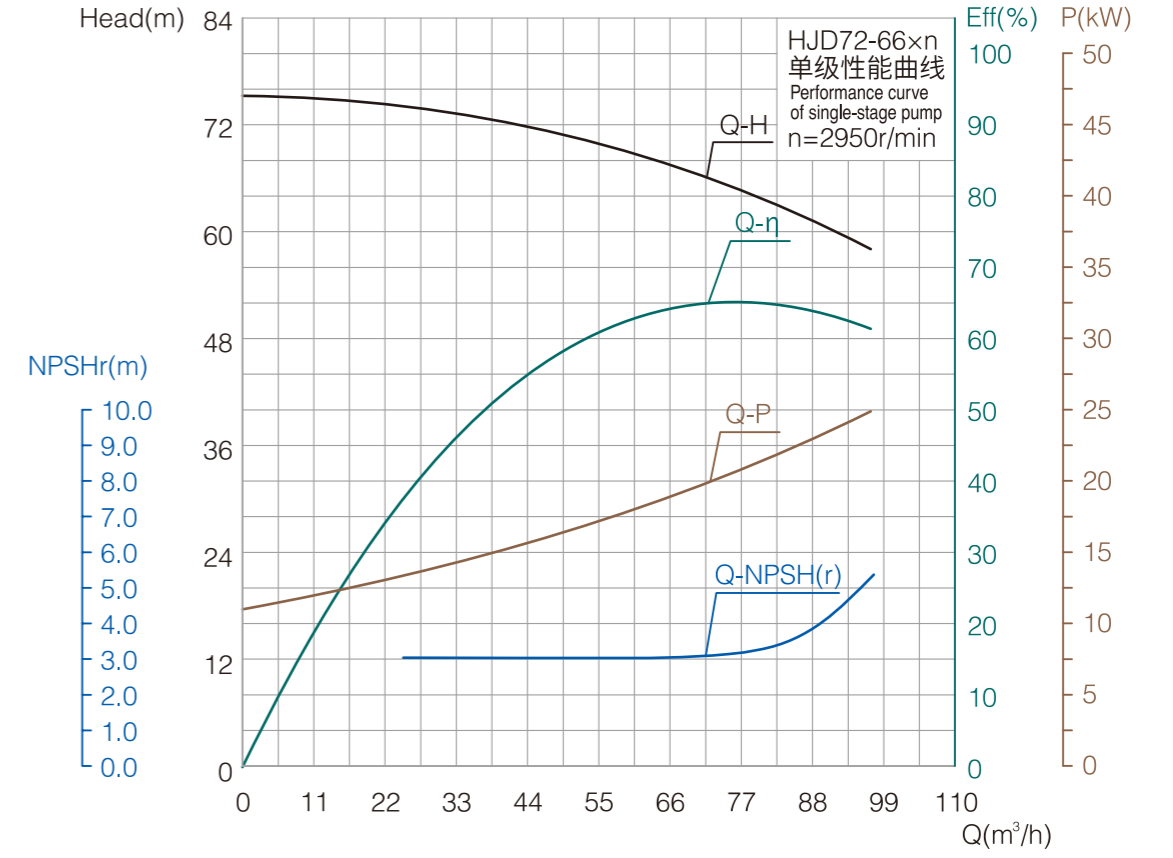
性能曲线 Performance Curve



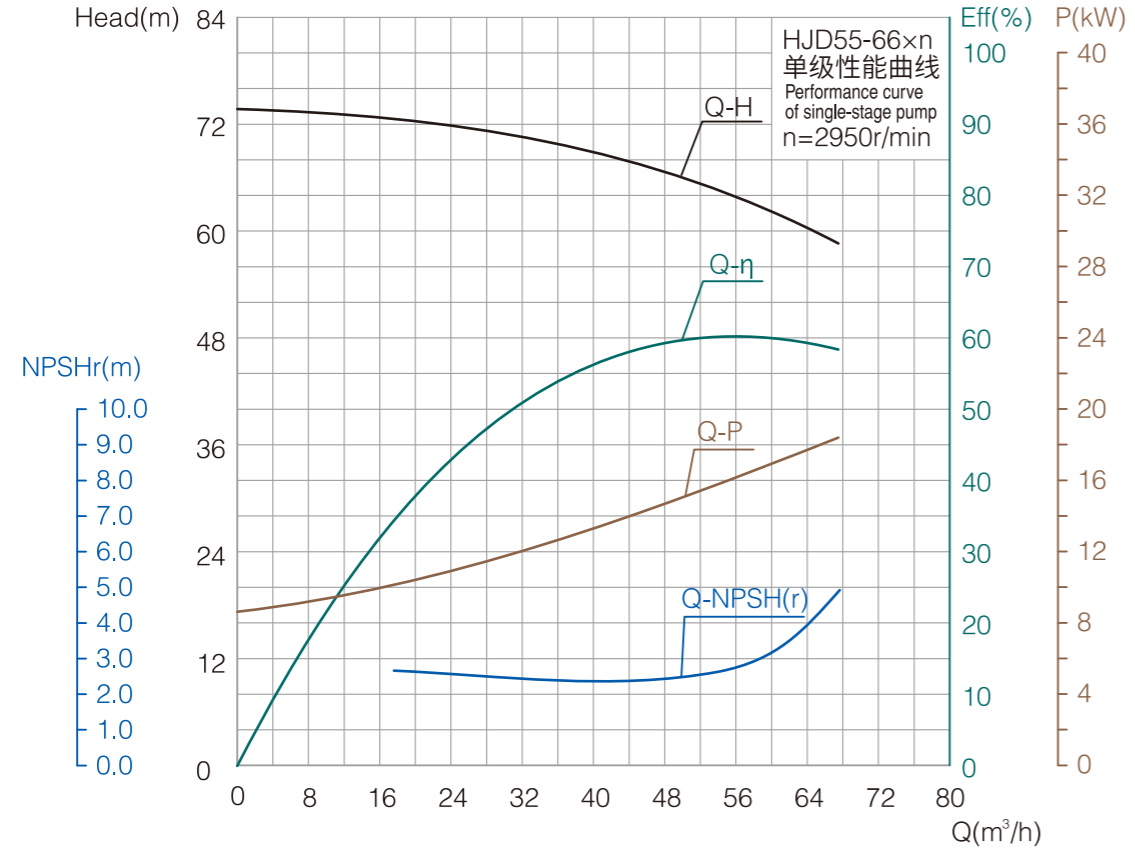
HJD25-66×n



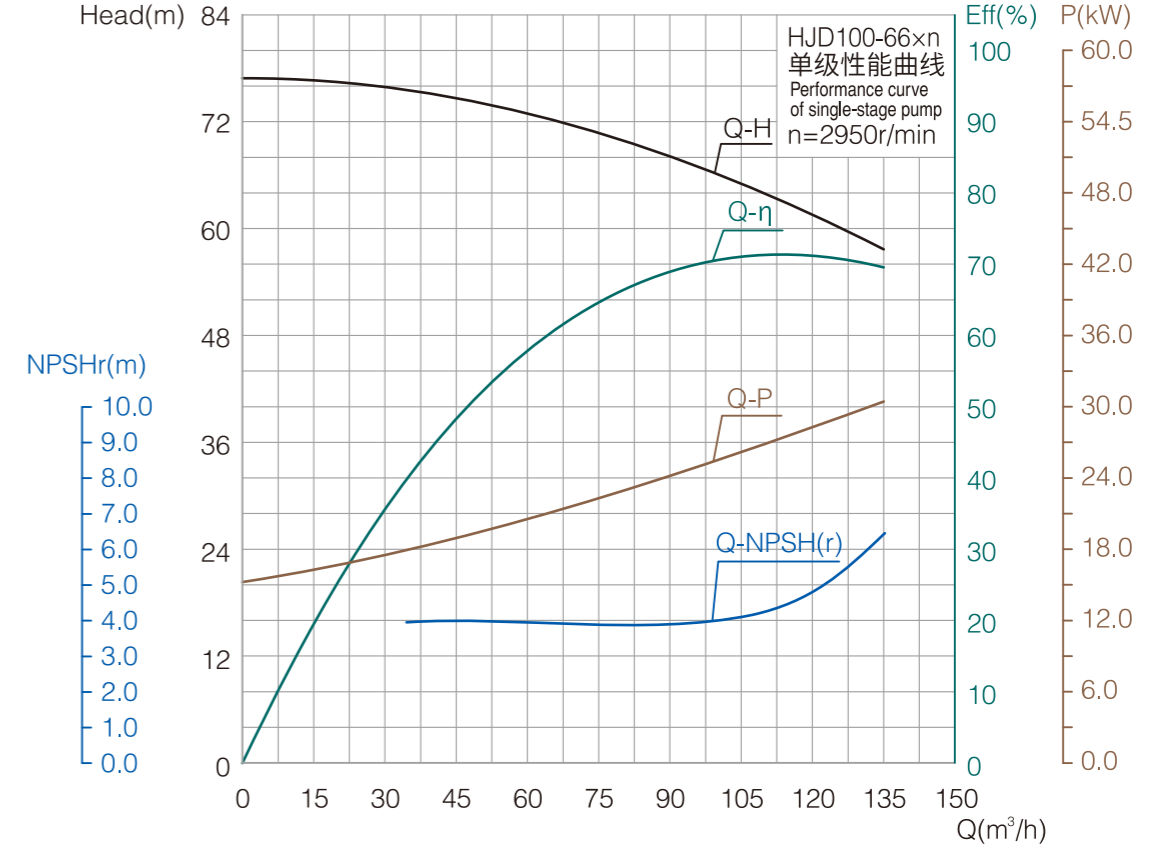
HJD72-66×n



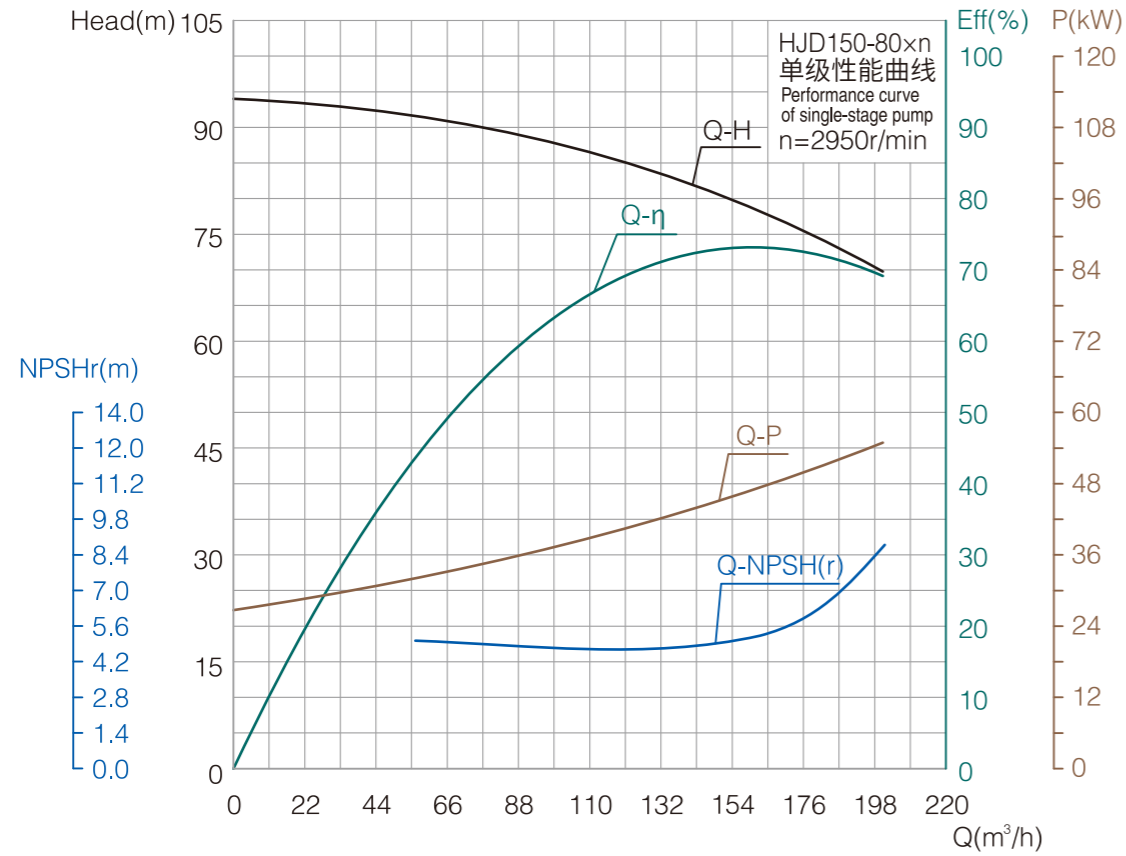
HJD50-66×n



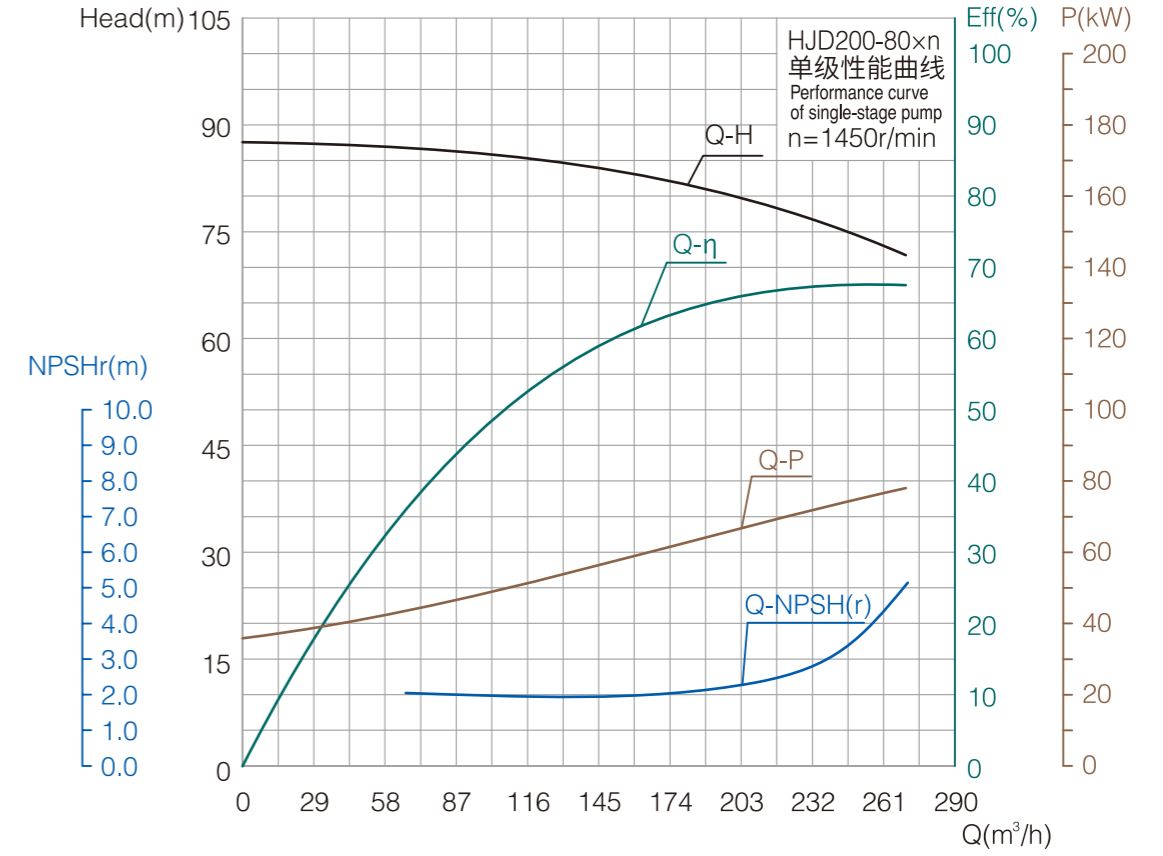
HJD100-66×n



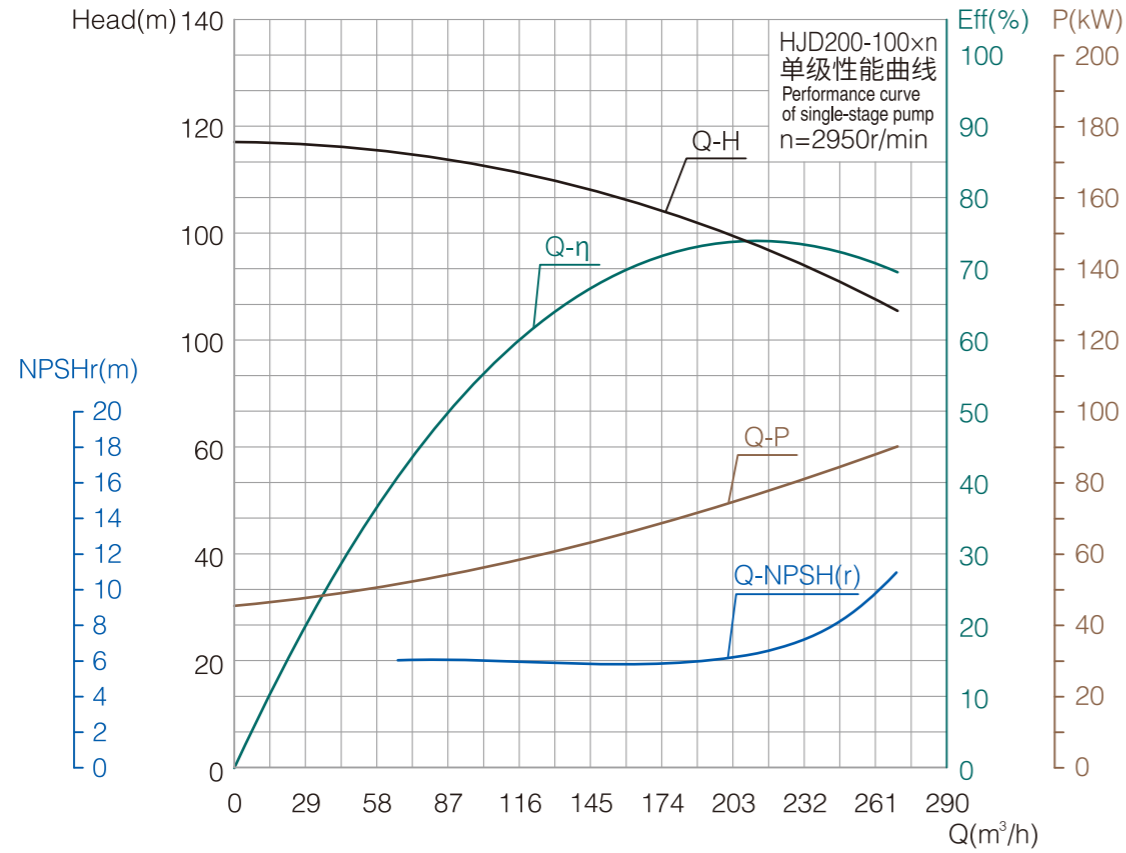
HJD150-80×n



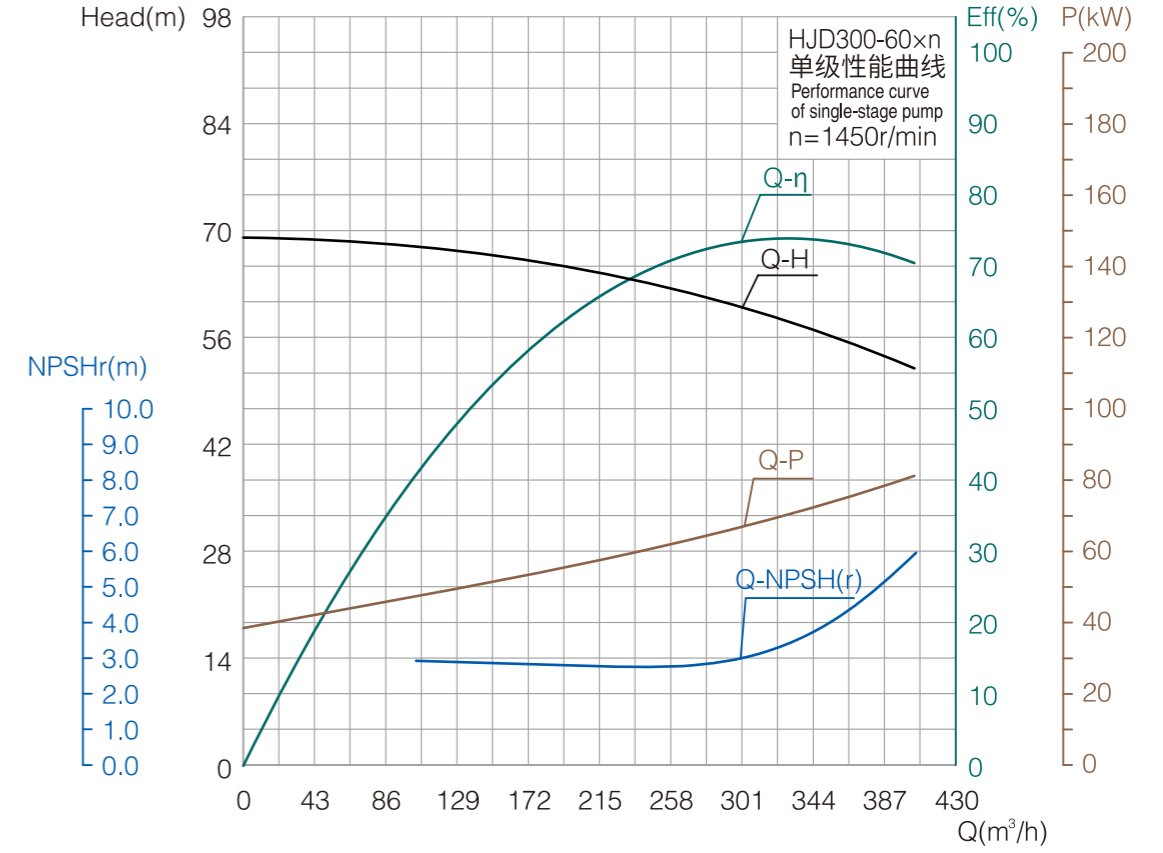
HJD200-80×n

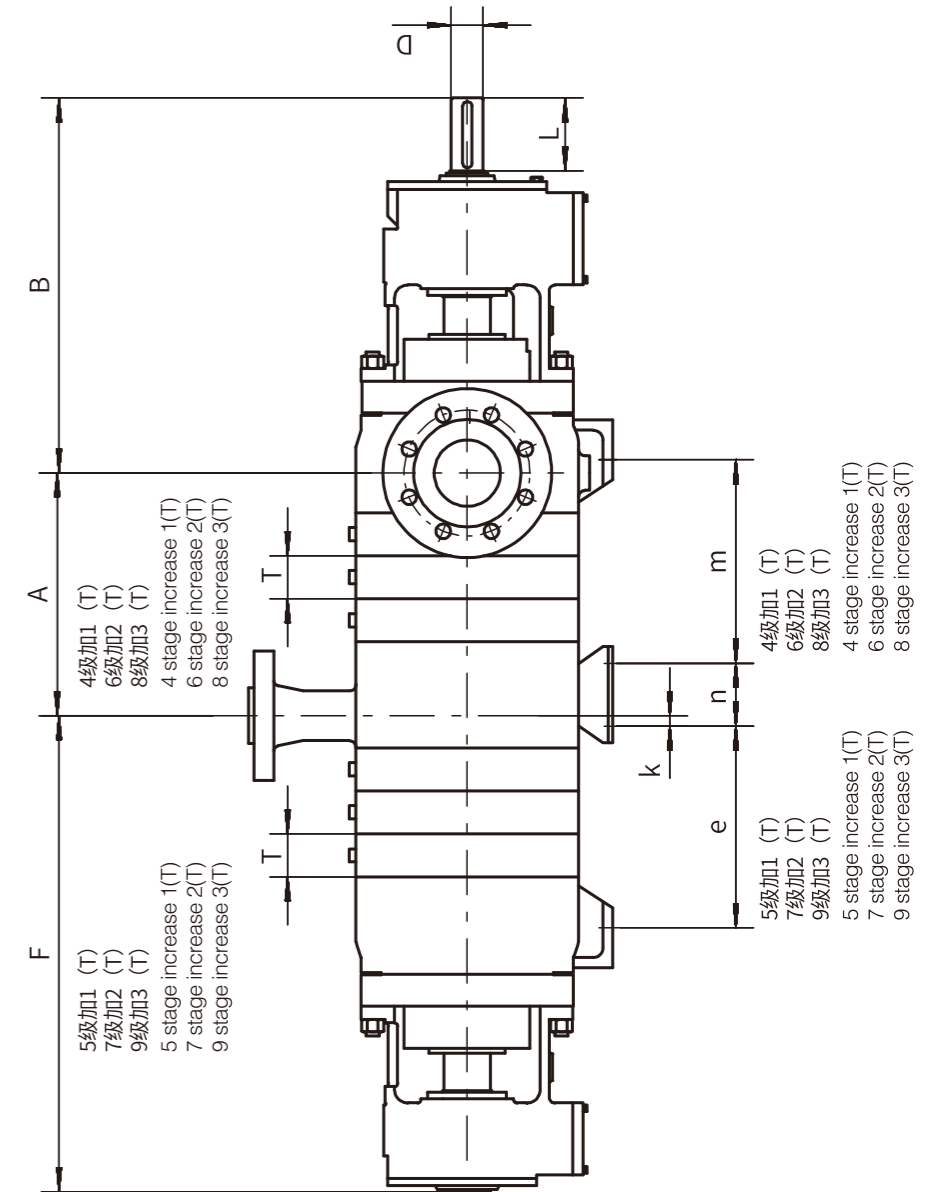
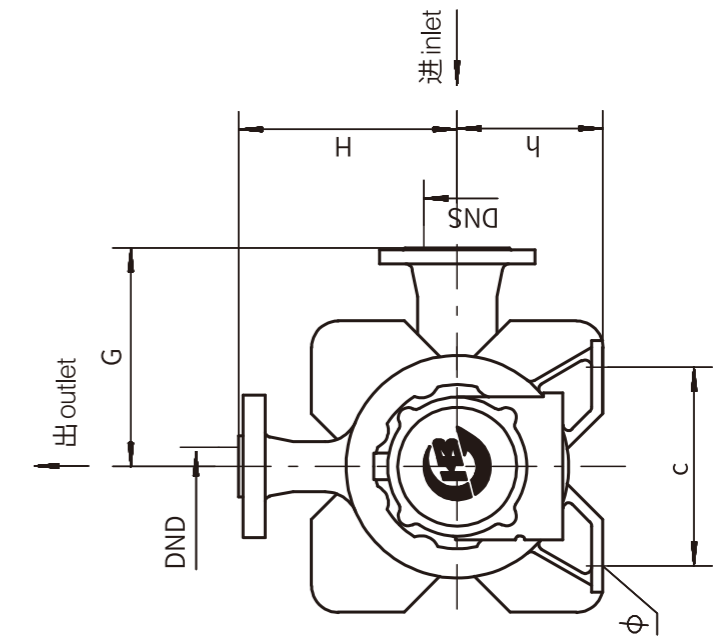
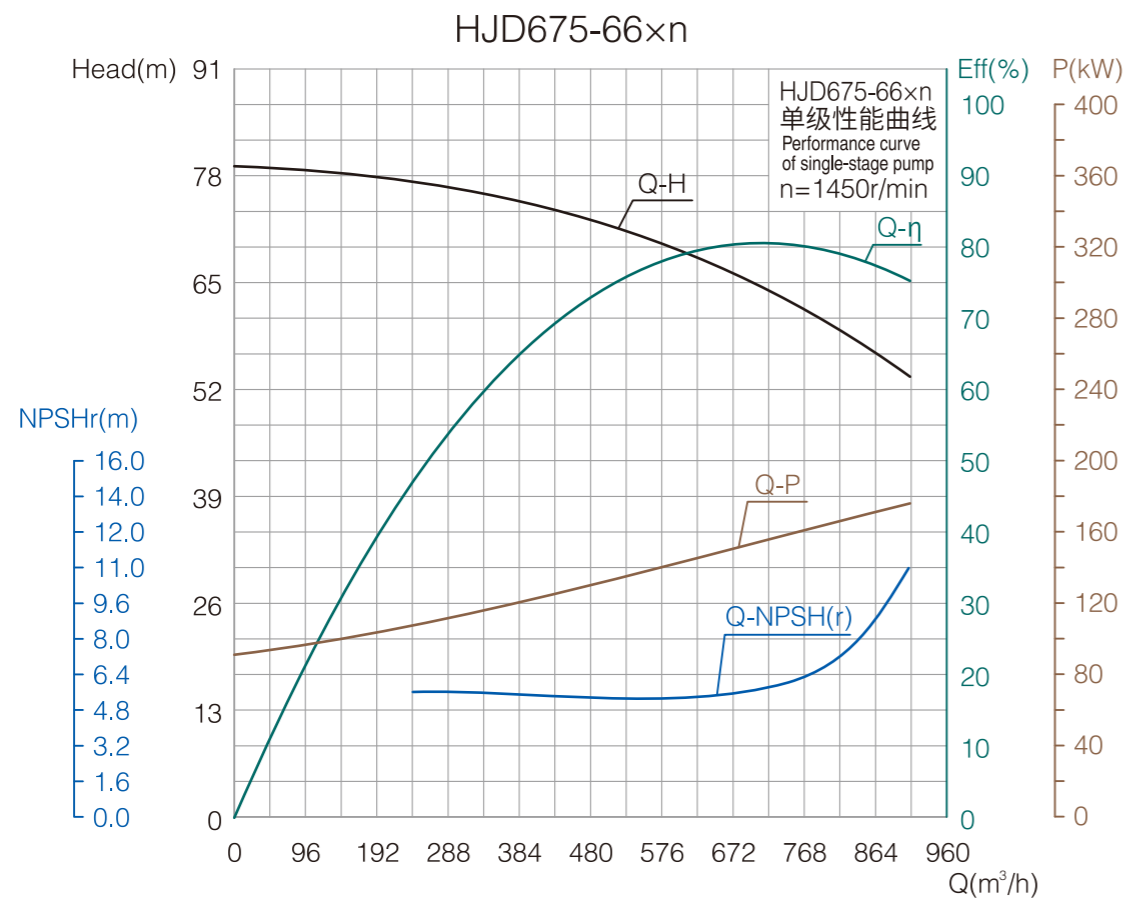
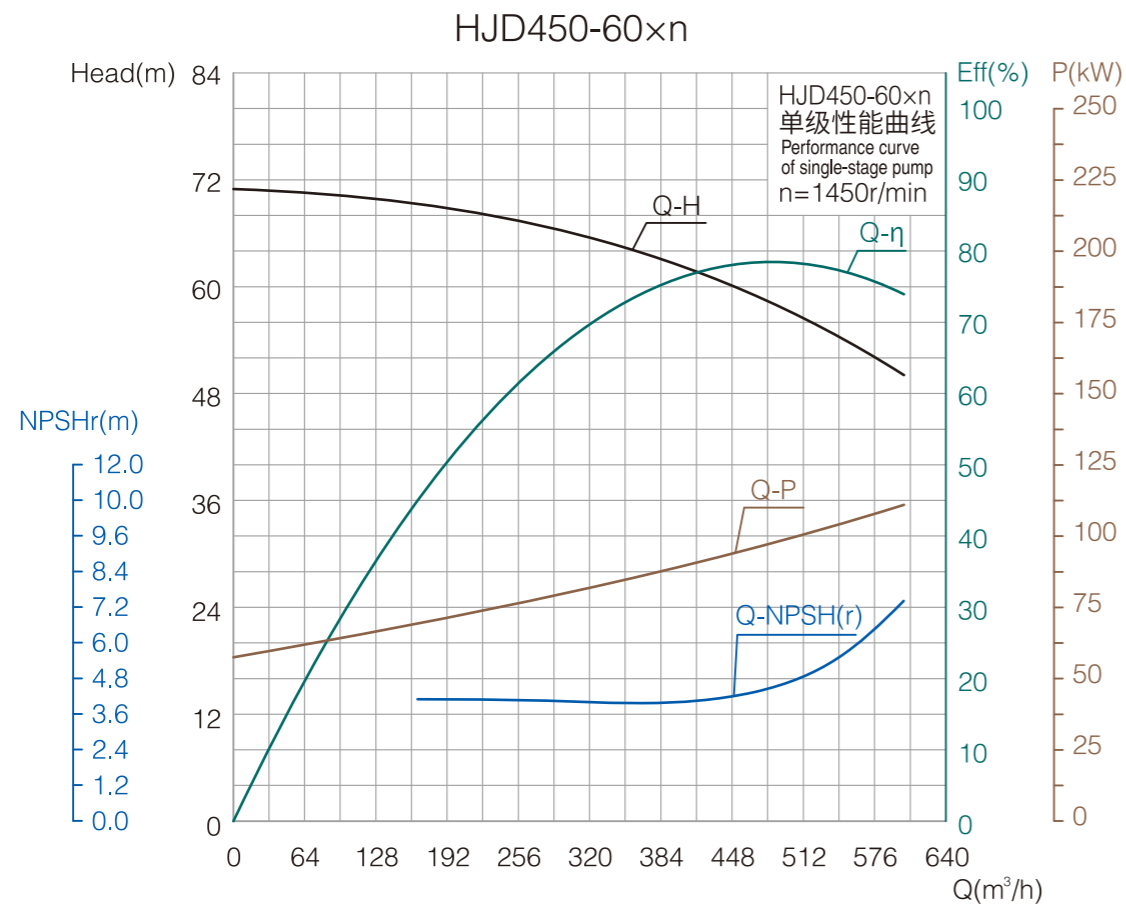


HJD200-100×n



HJD300-60×n





注：以上数据基于常温清水。Note: above data based on clean water under normal temperature.

| 型号 Pump Mode | DNS | DND | H | G | h | A | B | F | k | e | n | m | c | Ø | L | D | T |
|--------------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|------|-----|
| 6.3-50*3-L | 65 | 40 | 260 | 260 | 190 | 130 | 431 | 461 | 10 | 134 | 70 | 84 | 280 | 19 | 60 | ∅28 | 50 |
| 12.5-66*3-L | 65 | 40 | 260 | 260 | 190 | 116 | 506 | 492 | 20 | 122 | 60 | 88 | 280 | ∅19 | 110 | ∅42 | 45 |
| 25-66*3-L | 80 | 40 | 260 | 260 | 190 | 121 | 511 | 497 | 15 | 132 | 60 | 88 | 280 | ∅19 | 110 | ∅42 | 50 |
| 50-66*3-L | 100 | 50 | 330 | 330 | 220 | 171 | 566 | 588 | 16 | 174 | 95 | 112 | 300 | ∅28 | 110 | ∅48 | 65 |
| 72*66*3-L | 150 | 80 | 330 | 330 | 220 | 200 | 566 | 600 | 8 | 194 | 97 | 131 | 300 | ∅28 | 110 | ∅48 | 65 |
| 100-66*3-L | 150 | 80 | 330 | 330 | 230 | 232 | 619 | 665 | 17 | 220 | 115 | 164 | 330 | ∅28 | 110 | ∅55 | 85 |
| 150-80*3-L | 150 | 100 | 360 | 360 | 250 | 272 | 673 | 800 | 22 | 277 | 140 | 179 | 340 | ∅28 | 140 | ∅65 | 95 |
| 200-100*3-L | 200 | 150 | 400 | 400 | 270 | 241 | 673 | 920 | / | 384 | / | 240 | 380 | ∅35 | 140 | ∅80 | 100 |
| 200-80*3-L | 200 | 200 | 570 | 570 | 450 | 350 | 925 | 1200 | / | 503 | / | 385 | 600 | ∅42 | 210 | ∅100 | 120 |
| 300-60*3-L | 250 | 200 | 450 | 450 | 350 | 285 | 700 | 935 | -52 | 505 | / | 285 | 440 | ∅35 | 120 | ∅72 | 115 |
| 450-60*3-L | 250 | 250 | 570 | 570 | 450 | 360 | 945 | 1250 | / | 580 | / | 430 | 600 | ∅42 | 210 | ∅100 | 150 |
| 675-66*3-L | 300 | 300 | 570 | 570 | 450 | 410 | 925 | 1260 | / | 575 | / | 465 | 600 | ∅42 | 210 | ∅100 | 150 |

以上尺寸是3级泵尺寸，4级泵在3级泵的基础上A尺寸加 (1) T，5级泵在4级泵的基础上A尺寸加 (1) T……

The above dimension is for 3 stage pump; the dimension of 4 stage pump will be (1) T+dimension A based on 3 stage pump; the dimension of 5 stage will be (1) T+dimension A based on 4 stage pump and so on……