

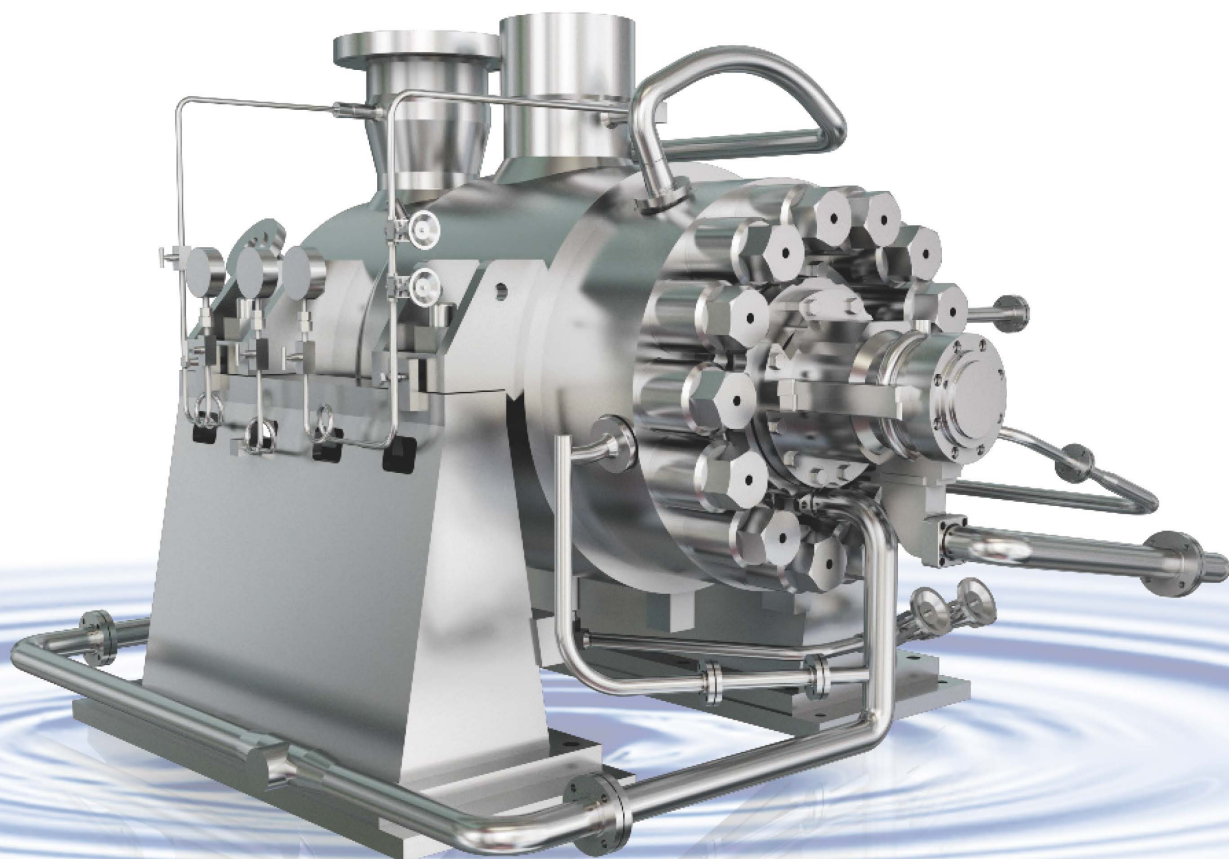


HSB/HDB

 **卧式双壳体多级泵**

Horizontal Double Casing Multi-stage Pump

【API610、API682】



荏原机械淄博有限公司
EBARA MACHINERY ZIBO CO.,LTD.

**HSB/HDB型泵为卧式、多级、转子两端支撑、内壳体水平剖分、外壳体径向剖分的高压离心泵。
HSB首级叶轮为单吸式结构;HDB首级叶轮为双吸式结构。**

HSB/HDB type pump is a high pressure centrifugal pump with horizontal, multi-stage, support at both ends of the rotor, horizontal division of the inner shell and radial division of the outer shell.

HSB is the type which first stage impeller is single suction structure; HDB is the type which first stage impeller is double suction structure.

特征 Features

- ◆ 对高温、高压具高可靠性
High pressure and temperature reliability
- ◆ 采用中心线支撑结构适应重负载工况
Centerline supported for heavy duty operation
- ◆ 柔性设计适用介质范围广泛
Flexibility of design handles wide range of liquids
- ◆ 所有部件可实现最大程度互换
All components have been designed for maximum parts interchangeability.
- ◆ 完全符合API610规范
Full compliance with API610 specifications

应用领域 Applications

| | | | |
|--|--|--|--|
|  燃煤 电厂 Coal Fired Power Plant |  核电站 Nuclear Power Plant |  工业 电厂 Industrial Power Plant |  冶金 钢铁 Metallurgical Iron and Steel |
|  石油化工 行业 Petrochemical & Chemical |  有色金属 冶炼 Non-ferrous Metal Smelting Industrial |  动力 回收 Power Recover Turbine |  其它化 工行业 Other Chemical Industries |

材质 Materials

| 部件名称 / Part name | 材质/Materials ASTM-AISI | |
|----------------------|------------------------|----------------|
| 外壳体/Outer Casing | ASTM A105 | ANSI 316 |
| 内壳体/Inner Casing | ASTM A478 CA6NM | STM A351 CF8M |
| 筒体盖/Casing Cover | ASTM A105 | ANSI 316 |
| 叶轮/Impeller | ASTM A478 CA6NM | ASTM A351 CF8M |
| 轴/Shaft | ASTM A276 410H | ANSI 316 |
| 泵体承磨环/Case Wear Ring | ASTM A743 CA40 | ANSI 316 |

说明:可依据要求更选其它材质
Note:Other materials supplied on request.

主要参数 Ratings

| | |
|--------------------------------|---|
| 流量 / Capacities | 根据要求可适用于广泛领域/ As required for any service |
| 扬程 / Heads | 根据要求可适用于广泛领域/ As required for any service |
| 最大工作压力 / Max.working pressures | 表压43MPa,也可以更高 / Gauge 43 MPa and up |
| 转速 / Speeds | 根据要求/ As required |
| 转向 / Rotation | 根据要求/ As required |
| 温度范围 / Temperature ranges | 根据要求/ As required |
| 叶轮型式 / Impeller type | 闭式 / Enclosed |
| 进出口方式(标准结构) / Nozzles | 管嘴上进-上出布置为标准配置 / Top-top standard with other nozzle placement available |
| 法兰 / Flanges | 焊接结构(可执行任何标准) / Welding with other standards available |
| 轴封型式 / Shaft sealing | 迷宫密封,机械密封和填料密封 / Throttle bushing, mechanical seal & packing seal |

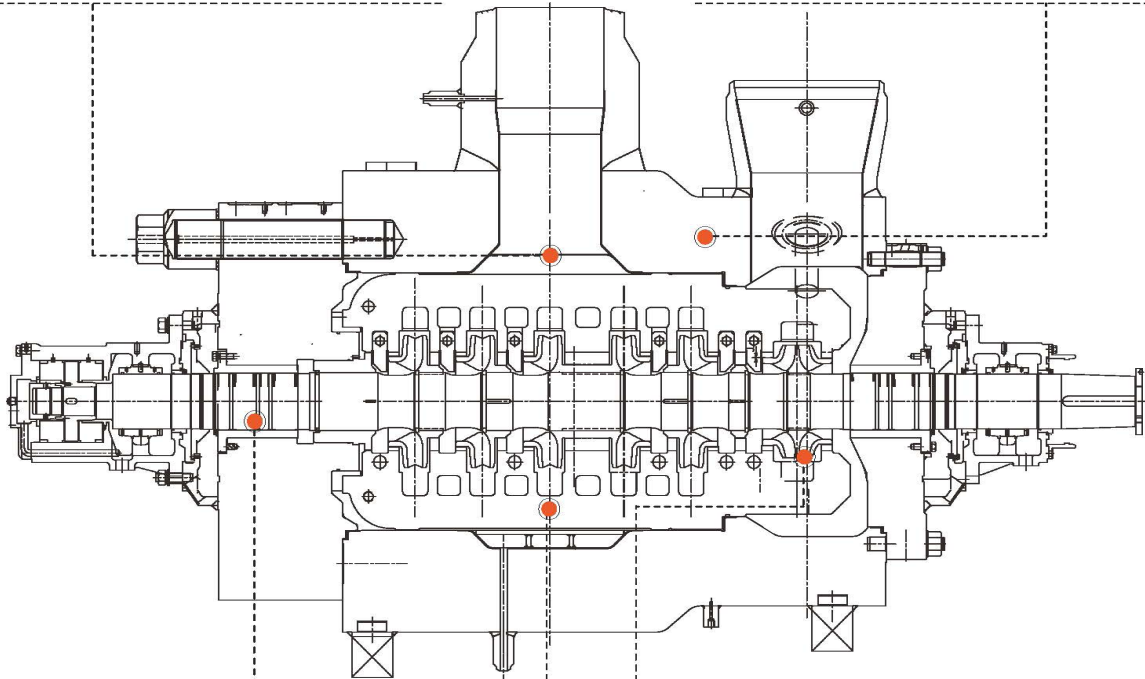
结构 Construction

冷态启动:内壳体为双蜗壳式结构,水平剖分,具备可以冷态启动,同心(可以用塞尺检测)运行优势。转子部件在安装前实现整体动平衡。

Cold Pump Start-up: Two-piece horizontally split inner-volute construction offers advantages of cold startup and concentric running clearances (which can be checked with feeler gauge). Rotating elements is dynamically balanced as assembly before installation.

高压设计:只有锻造的外筒体和端盖完全承受泵的出口压力。焊接结构的进口、出口管可布置在顶部或底部以方便配管布置。

Designed for High Pressure: Only forged steel barrel and discharge cover are exposed to full discharge pressure. Welded suction and discharge nozzles can be located at top or bottom for best main piping layout.



轴封选择:独有的迷宫密封外加注入低温凝结水保证了可靠运行、维修最少和磨损极低。对于较低要求的场合,也可以使用传统的填料密封。此外对于锅炉给水,推荐使用机械密封。

Choice of Shaft Seals: Exclusive design of throttle bushings with cold-condensate injection ensures reliable service, minimum maintenance and remarkably low wear. Packing seals are available for lower service requirement and mechanical seals are developed especially for boiler feed service.

停工期短:为使可靠性提高、维修减小、噪音降低,双动推力轴承自动调心、自润滑;滑动轴承采用标准巴氏合金轴承。

Less Downtime: For maximum reliability, reduced maintenance and lowest noise level, double-action pivot-shoe thrust bearing and self-aligning lubricated, babbitt-lined radial bearings are standard.

可选中间抽头:可从中间级抽送高压液体向再热器冷却装置提供喷水控制温度。

Optional Attemperator Tap: Pump stage can be tapped to provide water spray for hot reheat steam line temperature control.

低汽蚀余量:为降低泵汽蚀余量,首级叶轮可采用双吸式结构(HDB),也可选用单吸式结构(HSB)。

Low NPSH: First-stage double-suction impeller ensures low NPSH requirements. Also available in Type HSB single suction first-stage impeller.

轴向力自动平衡、可靠性高:叶轮成组背对背对称布置实现了在运行范围内轴向力自平衡,无需狭窄间隙的平衡装置。因此在管路系统中不需要连接到低压侧的管路。

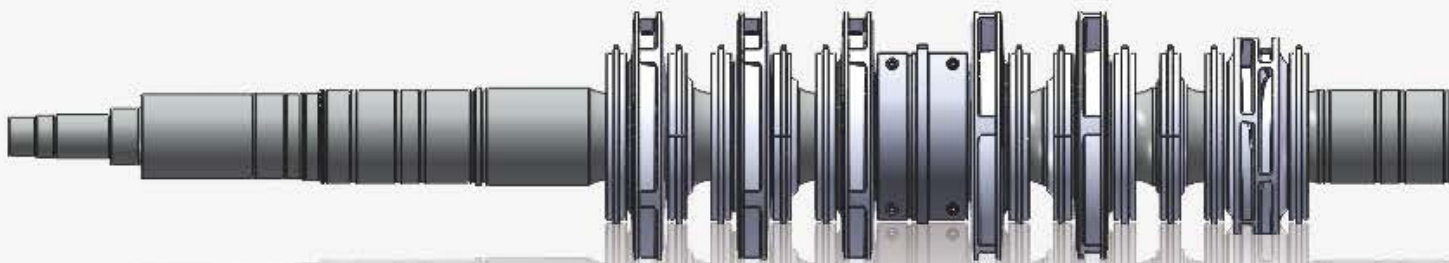
Inherent Axial Balance for High Reliability: Because of opposed impeller grouping, axial hydraulic thrust is inherently balanced over full operating range without use of close-clearance balancing device. Therefore, no external bleed-back piping to a low pressure point in the system is required.

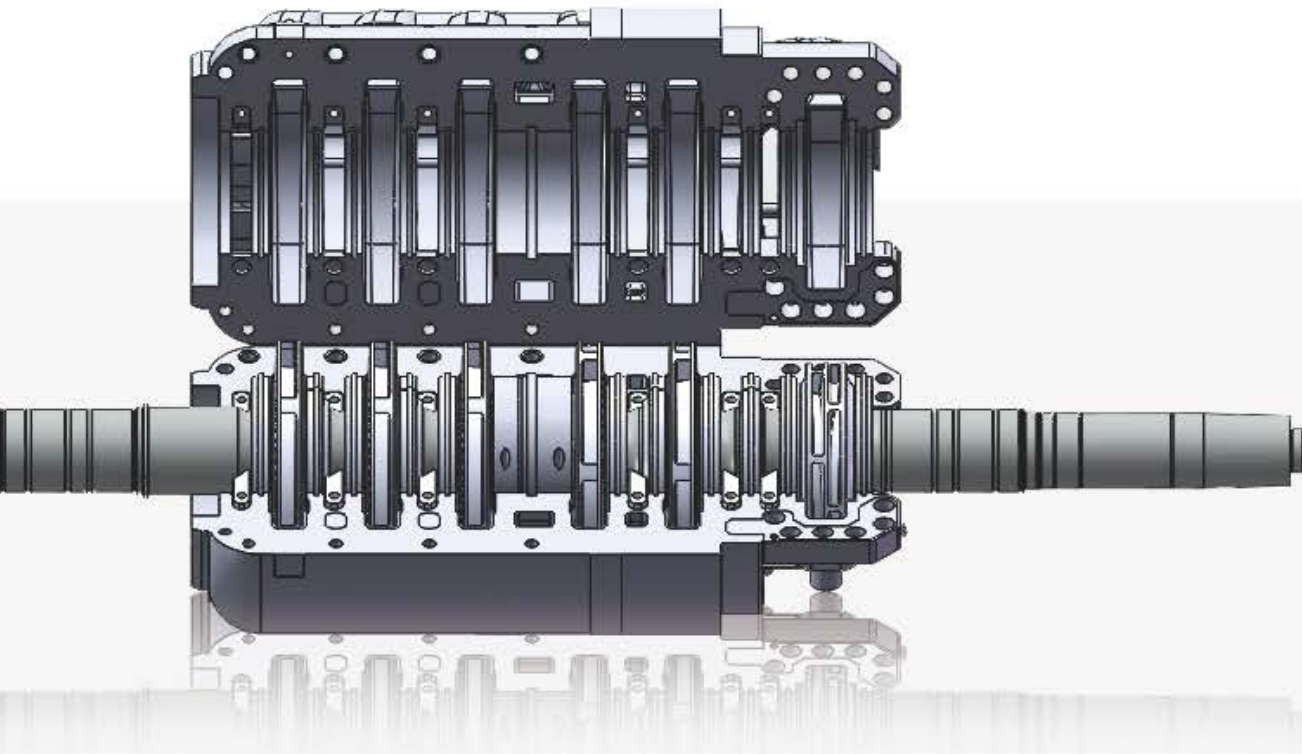
设计特征 Design Features

- 快速均匀预热 / quick and uniform preheating
- 轴向力自平衡, 没有专门的轴向力平衡装置 / axial balance without use of balancing devices
- 内壳体为双蜗壳式结构, 径向力自平衡 / radial balance through double volute construction
- 拆装维修方便 / ease of assembly and dismantling

转子部件放置于水平中分的内壳体内, 而内壳体放置于筒式外壳体内。由于内壳体和外壳体之间充溢着出口压力液体, 所以在只需要很小的螺栓就可以满足密封要求的同时也对密封面的精度要求变高。此外由于内壳体完全浸没在介质中, 承受与转子部件相同的温度, 因此可承受机组的热冲击。这种结构除了安全、高效之外, 可以实现不拆卸吸入、排出管路和驱动机的情况下维修芯。转子部件零件的磨损检测及间隙检查等可以在现场进行。双壳体泵也可在必要的情况下无须预热即可直接启动, 而没有泵变形及转子被卡住的危险。

The split inner case in which the rotating element is installed is positioned in a cylindrical outer barrel and requires only light bolting because the free space between the inner case and the outer barrel is exposed to discharge pressure, thereby sealing the precision surfaces at the split. As a result of surrounding the inner case with the pumped liquid, it is subjected to the same temperature as the rotating element, thereby permitting quick and uniform beating of the entire unit, in addition to safety and efficiency, this construction also lends itself to accessibility without disturbing the suction and discharge pipe connection or driver. A complete rotating element can be done in the field for inspection of parts subject to wear, checking of clearances, etc. The Double Case Pump can also be put on line without preheating when necessary, and without the accompanying dangers of distortion and seizure.





转子部件由叶轮、叶轮承磨环和泵轴等零件组成，材料的热膨胀系数相同。即使发生温度突变，转子部件的间隙都始终保持不变。

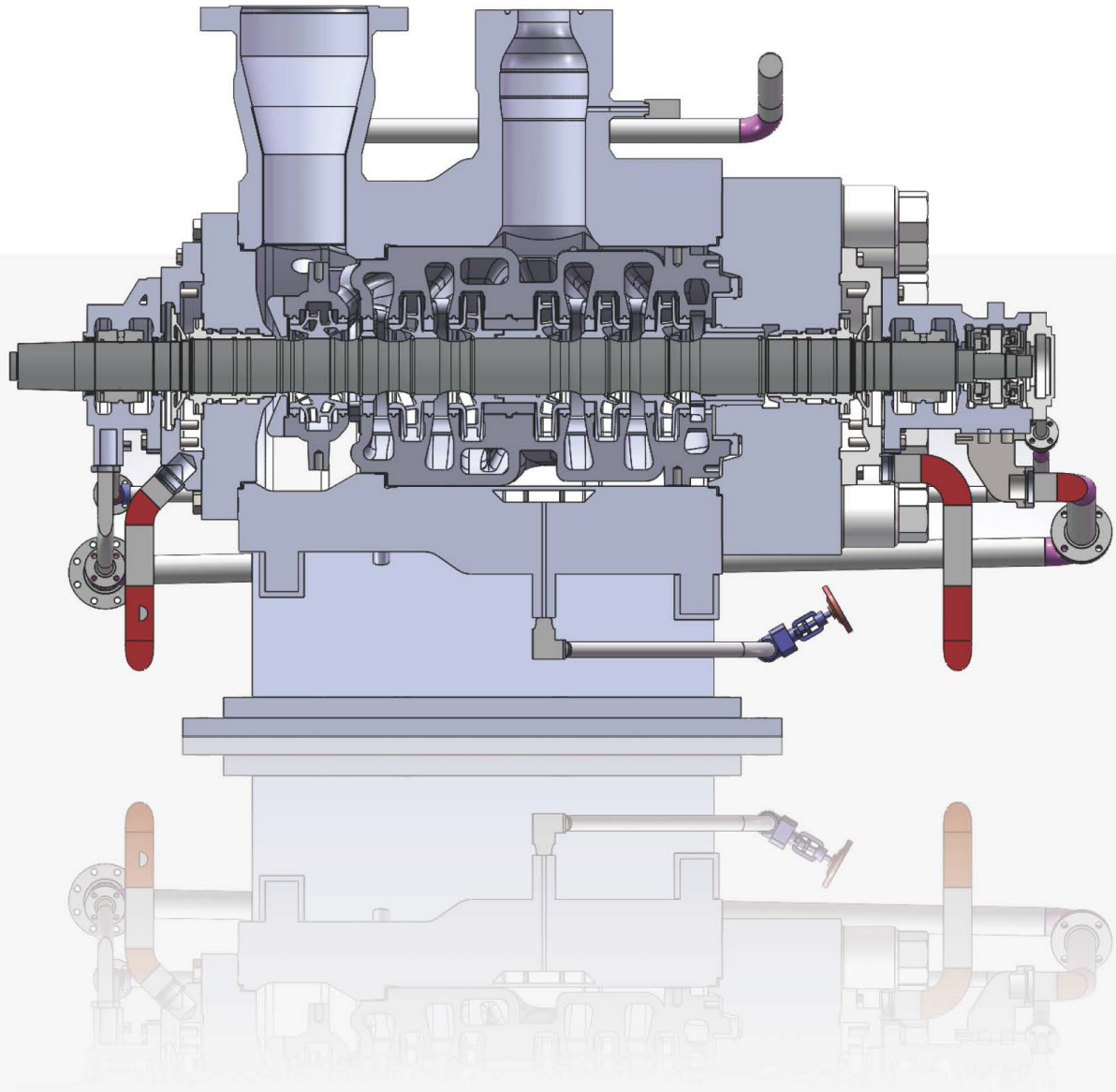
The completely assembled rotating element consists only of impellers with their rings and the shaft. Materials of the same heat expansion co-efficient are used. Running clearances of the rotating element are maintained at all times regardless of the pumping temperature or of sudden changes therein.

设计特征 Design Features



通过双蜗壳结构，液流被分流到两个独立对称分布的流道中，大小相等的径向力相互抵消而使泵轴不会产生弯曲和扭矩。在任意流量下，由于叶轮的对称分布，轴向力也被自动抵消。由于内壳体采用了双蜗壳设计，转子部件采用了对称布置叶轮，实现了径向力和轴向力自动平衡。

By the use of Double volute inner cases, the flow is divided into two identical fluid channels in the plane of the impeller, with outlets 180° apart. Opposed forces of equal magnitude are created and radial balance without pressure-bending moment on the shaft, at any capacity, result. Due to exclusive staging and impeller arrangement, axial thrust without the use of balancing devices is eliminated. The inner case, by its Double volute design, and the rotating element, by its staging arrangements, eliminates both axial and radial thrust.



当需要对内部检修维护时,打开外筒体泵盖、装上拆装架、拉出内壳体后吊起内壳体的上壳体,就可以从壳体中拿出转子部件,主管路和驱动机都不需要拆动。

When internal inspection becomes necessary, open up the outer barrel cover, install the dismantling tray; pull out the inner cases then lift upper half of the case and the completely assembled rotating element are taken out from the case without disturbing the main piping and driver.

Looking ahead,
going beyond expectations
Ahead  *Beyond*



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