杭州大路实业有限公司
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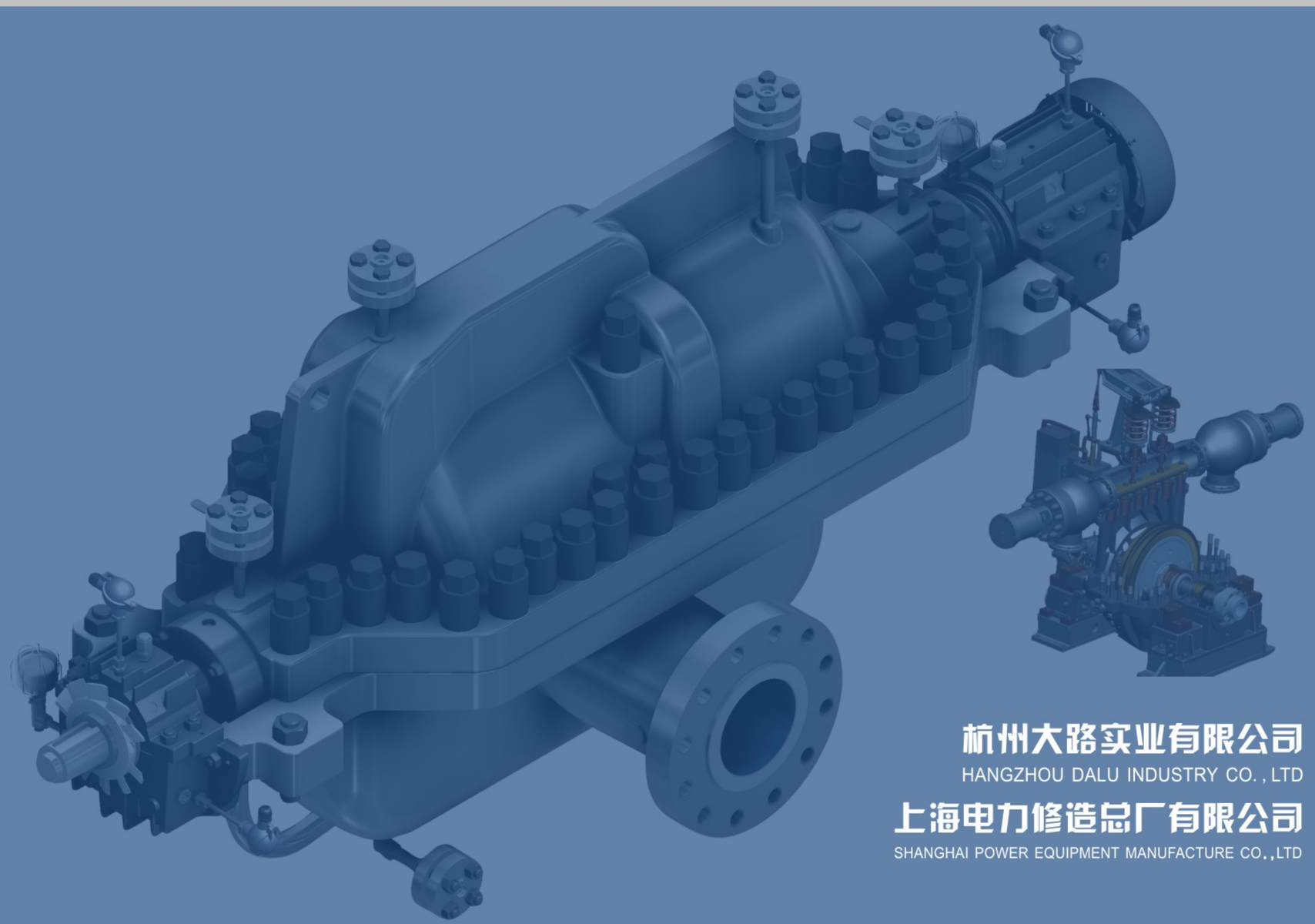
中国电建
POWERCHINA

LULUTONG

PUMP & TURBINE

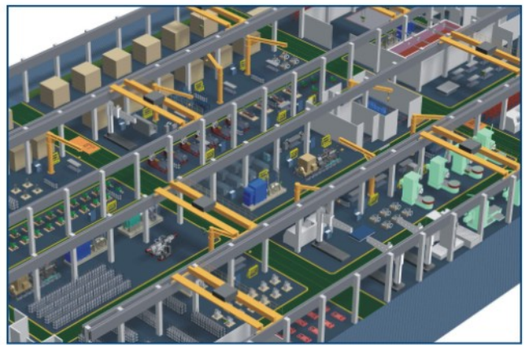


杭州大路实业有限公司
HANGZHOU DALU INDUSTRY CO. , LTD
上海电力修造总厂有限公司
SHANGHAI POWER EQUIPMENT MANUFACTURE CO.,,LTD

COMPANY
INTRODUCTION

Hangzhou Dalu Industry Co., Ltd. was founded in 1973, which is now a company on equity cooperation with Shanghai Power Equipment Manufacture Co., Ltd (a company subordinated to Power Construction Corporation of China). Hangzhou Dalu, over years of development, has been a membership of Chinese Nuclear Society and a qualified supplier of process pumps, turbines & systems for coal chemical industry, petroleum and petrochemical, including Petrochina, Sinopec, etc. As a new high-tech enterprise certificated by the State, Hangzhou Dalu has a provincial R&D center and a provincial technical center with all engineers of 60, in total 280 employees.

Hangzhou Dalu is mainly engaged in designing, manufacturing and serving of petrochemical process pumps, magnetic driven pumps, military & nuclear pumps, radial-flow turbines and industrial drive turbine & turbine driven pumps units. All those products have been widely used in oil & natural gas chemical industries, coal chemical industries, fertilizer plant, refining area, ocean engineering, national defense and military project, etc.



Enterprise Qualification

GB/T19001-2008/ISO9001:2008
Quality Management System Certificate

GB/T24001-2004/ISO14001:2004
Environmental Management System Certificate

National High-tech Enterprise Certificate

National Industrial Product Production Licence

Petrochina, Sinopec, CNOOC Internet Access Certificates

Patent for Utility Models and Invention

Technical Capability

Outstanding professional technical innovation groups, strong product design and development abilities

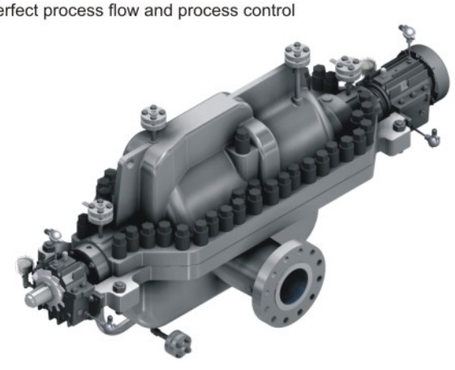
All products employing CAD, CFD, finite element etc. CAD/CAA technology

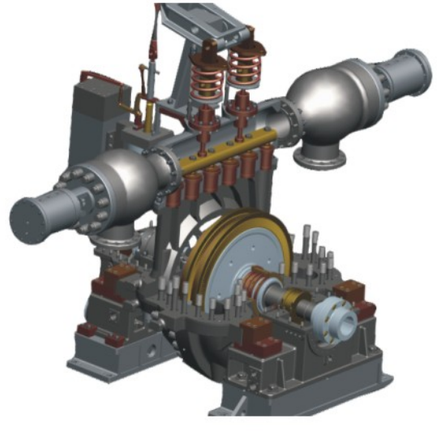
Products compliant to API610/685, API611/612, ASME, ISO, GB/GJB standards

Application of advanced CAT system

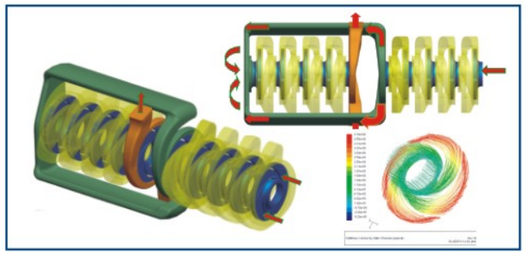
Application of industrial equipment remote monitoring and diagnostic system technology

Perfect process flow and process control

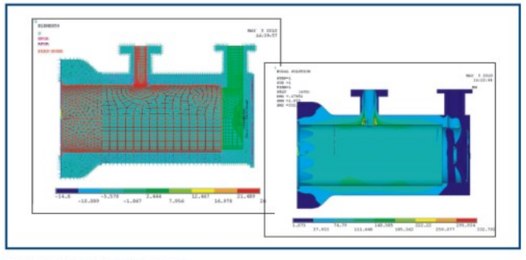




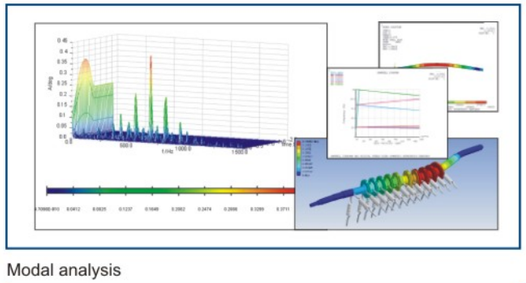
Flow field analysis



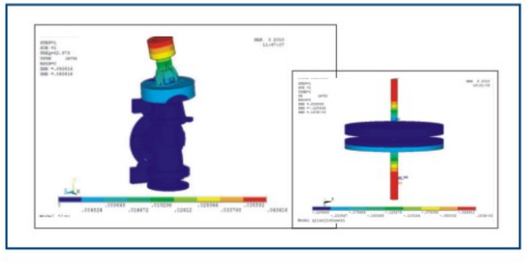
Strength analysis



Rotor dynamic analysis



Modal analysis



Manufacturing Capability

Complete solutions for pump manufacturing process: pattern making, component machining, pump assembling, performance testing, painting and packing

workshop area 15000m^2, Max. lifting weight 50 tons

To fulfill accuracy requirement from serious products, we have bought middle/large-scale CNC machining equipments, advanced testing equipments and other common or special equipment, in total 400 sets

Accuracy of balancing equipment G1.0 and G0.4

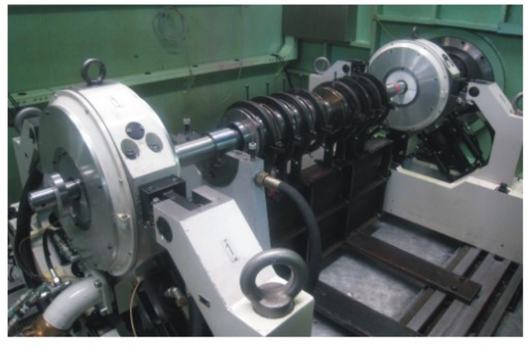
In order to ensure pump quality and realize lean manufacture, we built three production lines

- ☐ Standard magnetic and centrifugal pumps quick assembly line
- ☐ Engineered pump line for customized products
- ☐ Customized line, designed for turbine and turbine driven Pump integral unit

We have customized CAT system for pump and turbine, which can provide high measurement accuracy and offer data real-time remote transmission

We provide 3MPa high pressure steam testing system, to make test come true in the whole on-load working condition when steam turbine driving pump unit.

standard magnetic pump and centrifugal



standard magnetic pump and centrifugal

standard magnetic pump and centrifugal

Pump & Turbine Testing Capability

Pump testing center is qualified with CMC

Pump testing system is compliance with accuracy requirements in GB3216 Grade B, ISO9906 Grade 1

Pump Max. testing flow 15000 m^3/h, Max. testing power 2800kW, Max. test loop pressure 35MPa

Steam turbine Max. testing pressure 3MPa, Max, testing temperature 400℃, Max. testing steam flow 20 t/h

Steam turbine following API612 Standard can go through mechanical running test, performance test, string test and auxiliary equipment test

Pump and turbine testing process is completely automatically operated and can realize data real-time remote transmission and the test data as well is high precision and reliable.

Test bed area 5000m^2 and 13 large, medium or small testing positions, which can meet all products test requirements

- ☐ 3 medium/large testing position for speed feed pump
- ☐ 7 medium/large testing position for booster pump
- ☐ 1 testing position for high-power pump unit
- ☐ 1 string testing position for pump unit driven by turbine
- ☐ 1 testing position for special pump

standard magnetic pump and centrifugal

standard magnetic pump and centrifugal

standard magnetic pump and centrifugal

Magnetic Drive Pump

Our magnetic drive pumps are standard petrochemical process pumps designed according to API685. They have the feature of leak-tightness, simple structure, small noise & vibration, easy maintenance, high reliability, etc. They are widely used in petrochemical industries, coal chemical industries, medicine area, environmental protection area, military industry and nuclear industry. This pump totally has seven models in our factory: MDCA, MDCE, MDCT, MDCG, MDCY, MDCZ and MDCQ.

Design Feature

Executive standard: API685 and SH3148-200

Structure type: OH1/OH2, BB2, BB4 and BB5

Axial force balance: adjustable auto balance, impeller symmetrical distributed, balancing drum, etc.

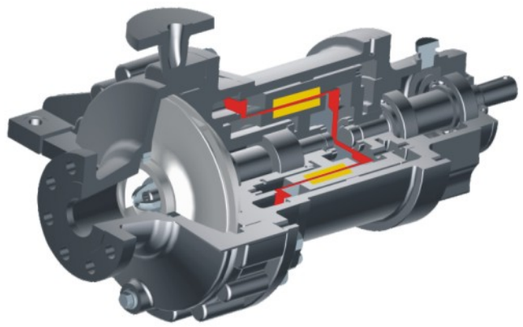
Shaft seal and washing pattern: no-sealing, leak-tightness, generally no auxiliary washing system

Magnetic material: high temperature samarium cobalt, no demagnetization under 350℃

Isolation cover: TC4, HC4 or engineering ceramics, high resistivity, small eddy-current loss

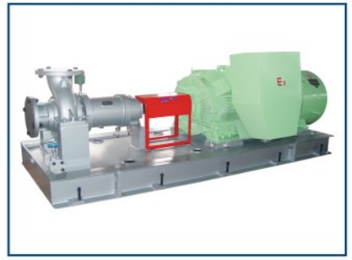
Bearing and lubrication: sliding bearing (Sic, impregnated graphite), self-lubricating

Configuring monitoring and protection systems of temperature, pressure, power or current and liquid leakage according to operation condition



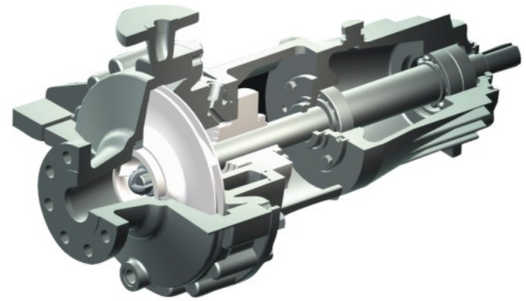
Performance parameters

Flow：2.5 m^3/h to 3600 m^3/h
Head：5 m to 400 m
Temperature：－90℃ to 400℃
Pressure：2.5，5 MPa
Speed：to 3600 r/min



Standard Single-Stage Pump

Standard single-stage pump is made in horizontal OH1/OH2 structure containing high degree of standardization. The pump can be widely applied to the extreme industrial process in petroleum and petrochemical industries, coal chemical industries etc. We have this pump in several series models such as HZA, HZE, HZAQ, HZW and HZF. In these series different norms of basic parts are Interchangeable.



Design Feature

Executive standard: API610

Structure pattern: OH1/OH2

Shaft seal: conform to API682 seal cavity, suitable for various seal arrangements incl. cartridge mechanical seal and dry gas seal in most severe running condition with/without double ends under pressure

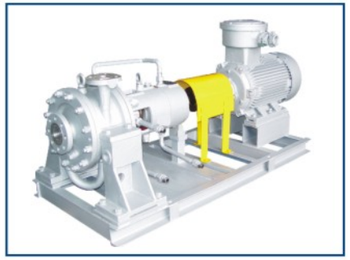
Impeller manufacture: precision cast and high precision dynamic balance test

Principal axis design: completely conform to API axial deflection and radial run-out standard

Pump case and pump cover: metal-to-metal match, compressible metal spiral wound gasket

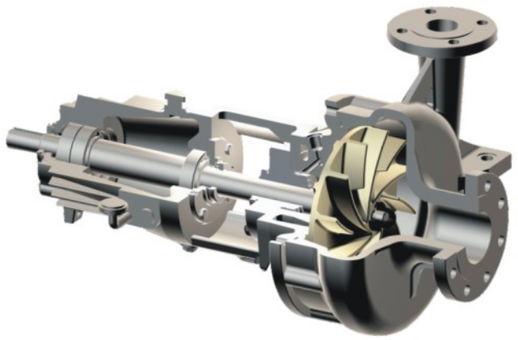
Performance parameters

Flow：1.6 m^3/h to 3000 m^3/h
Head：5 m to 400 m
Temperature：－45 ℃ to 450 ℃
Pressure：2.5，5 MPa
Speed：to 3600 r/min



Chemical Pulp Pump

Dalu chemical pulp pump follows petrochemical industry OH2 layout requirement, with hidden structured vortex impeller inside. The pulp pump, through inner channels, can freely transport liquid and solid particle mixtures (containing large particles, continuous fibers, slurry, sewage, etc.) or liquid, solid and gas mixtures with high gas content. It can be widely used in the areas of synthetic rubber, polymerization, papermaking, metallurgy, sewage treatment, etc.



Design Feature

Structure pattern: OH2

Structural feather: back pullout design

Hydraulic design: vortex hydraulic power; hidden back impeller; spacious channel cavity

Lossless convey: solids directly discharged from the pump outlet through the impact of impeller centrifugal force

Bearing housing: compliant with API610 standard; thin oil lubricated; auxiliary blade balancing axial thrust

Shaft seal configuration: API682 standard sized cartridge mechanical seal and relevant seal flushing system; adoption of plan 32 washing solution.

Liquid passage part: precision casted; cavity polished

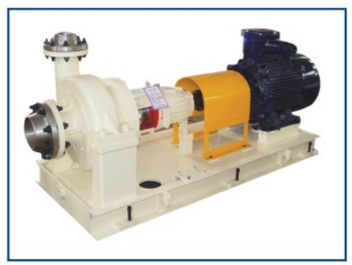
Performance parameters

Flow：to 800 m^3/h

Head：to 80 m

Temperature：to 180 ℃

Pressure：to 2.5 MPa



Single-stage Double suction Axially Split Centrifugal Pump

This product needs to be horizontally fixed. It adopts single stage double suction impeller and pump body axially split structure. Both pump inlet and outlet are on the body. The body structure makes it easy for rotor maintenance only by opening pump cover and replaced by whole preassembled rotor part. For this series, we have model HAS and HKS. HAS is intended for clean water and supported by bottom feet, while HKS is intended for petrochemical industries and hold up by central line support feet.

HAS series is suitable for clean water or such medium. Apply for municipal administration, mine, power station, water conservancy and factory utilities water supply application.

HKS series is applied to petrochemical industry, chemical fertilizer, coal chemical industry, electricity, metallurgy and ocean engineering.

Design Feature

Structure pattern: BB1

Hydraulic design: double suction; efficient hydraulic model together with CFD process analysis and optimization; staggered blade arrangement

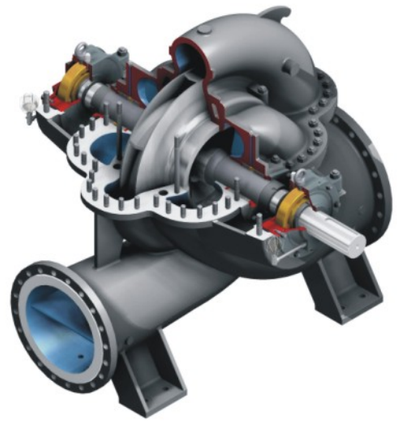
Force balance design: double volute type; double suction impeller

Pressure casing: axial split design; inlet and outlet on lower casing

Bearing housing: compliant with API610 standard; supported by two ends; respectively placed on pump's two ends; thin oil lubricated sliding/rolling bearing; high rigidity main axis

Shaft seal configuration: API682 standard sized cartridge mechanical seal and relevant seal flushing system

Wearing ring: changeable sealing rings for impeller and pump casing



Performance parameters		
	HSA	HKS
Flow (m^3/h)	to 25000	to 10000
Head (m)	to 135	to 250
Temperature (℃)	to 120	to 200
Pressure (MPa)	1.6 ， 2	to 11
Speed (r/min)	to 2950	to 3600

Radial Split Heavy Industry Utility Pump

This is a type of centrifugal pump in BB2 structure that is supported by both ends and can be split in radial direction. As per performance parameters, this centrifugal pump can be divided into two-stage single suction type, single-stage double suction type and two-stage double suction type. The heavy industry utility pump is usually applied to chemical industries where large flow and high head pump is required. Other industries, such as petroleum refining area, refinery, petrochemical area, pipeline storage and transport, coal chemical area, water supply, desalinator, etc., also use it to transport clean/ a bit polluted, low/high temperature chemical neutral/corrosive liquid. The pump now available in our factory is model HAY and model HYS.

Design Feature

Executive standard: API610

Structure pattern: BB2

Liquid passage design: adoption of CFD analytical technology

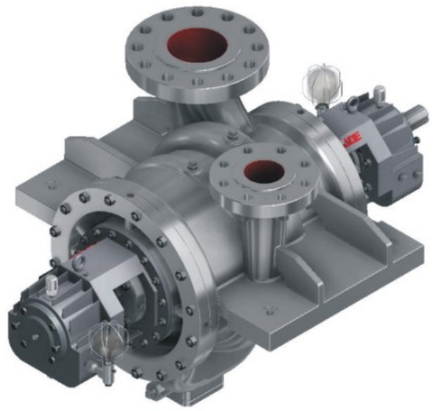
Pump body and pump cover: metal-to-metal match, compressible metal spiral wound gasket

Force balance design: double volute design; back-to-back type of two-stage single suction impeller (or double suction)

Bearing housing: conform with API610 standard; supported by two ends; respectively set on pump's two ends; water/air cooled; thin oil lubricated; high rigidity main axis

Mechanical seal: API682 standard sized cartridge mechanical seal and relevant seal auxiliary system

Wearing ring: changeable sealing rings for impeller and pump casing



Performance parameters

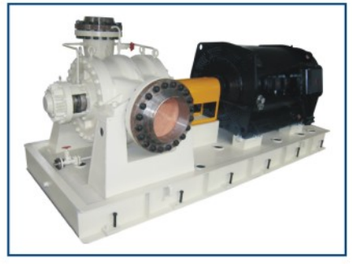
Flow：to 6000 m^3/h

Head：to 550 m

Temperature：−45℃ to 450 ℃

Pressure：5.0，10.0 MPa

Speed：2950 r/min，1475 r/min



Axially Split Multistage Pump

This is a type of centrifugal pump in BB3 structure that is supported by both two ends and can be split in axial direction. More specifically, this type of pump (HDK) is structured in horizontal, multistage, back-to-back layout and central line supported. It is applied in working conditions, such as crude/refined/residual oil transport in oil field's/petrochemical industries' long-distance transport pipes, oil gathering station, water injection station, oil production factory and refined oil storage, where high head pump is required for liquid transport. Metallurgical, mining, building, electric power, water supply and drainage industries also use it to transport similar liquid.

Design Feature

Executive standard: API610

Structure pattern: BB3

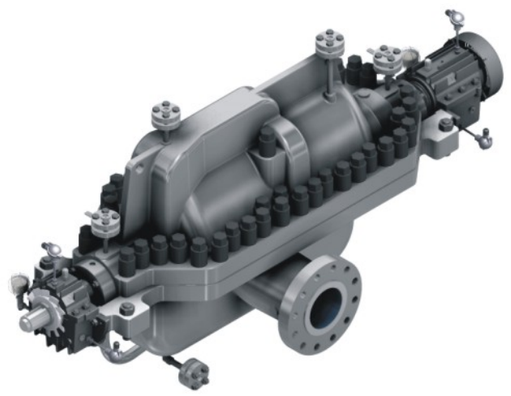
Casing structure: axial split structure; inlet and outlet pipe orifices on lower casing part; up-to-down contraposition liquid passages (double volute type and inset guided vane type)

Force balance design: double volute type or inset guided vane type; multistage impeller back-to-back symmetric arrangement

Bearing housing: compliant with API610 standard; supported by two ends; separately set on pump's two ends; water /air cooled; thin oil lubricated; high rigidity main axis; precision dynamic balance tested

Mechanical seal: API682standard sized cartridge mechanical seal and relevant seal auxiliary system

Wearing ring: anti-adhesive material made



Performance parameters

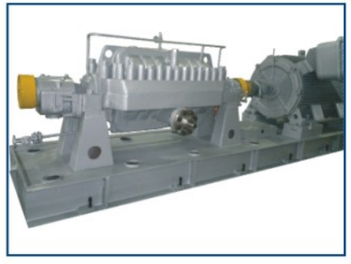
Flow：25m^3/h to 3600 m^3/h

Head：200m to 1000 m

Temperature：−40℃ to 180 ℃

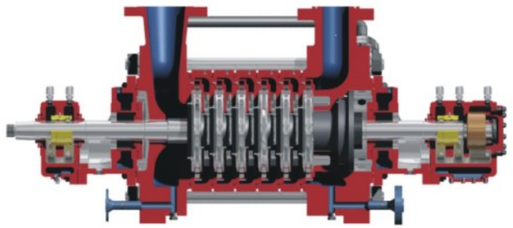
Pressure：5MPa to 10 MPa

Speed：2950 r/min



Segmental Multistage Pump

HDG segmental multistage pump is a horizontal centrifugal pump designed in BB4 structure. It is supported by central line and can be split into several segments in radial direction. This product is mainly used in working conditions, such as boiler feed water, oilfield injection, oil transport, chemical process feeding, etc., where high head pump is required for liquid Transport.



Design Feature

Executive standard: API610

Structure pattern: BB4

Segment structure: application of high precision spigots

Force balance design: guide vane type; using balance drum to balance axial thrust

Bearing housing: conform with API610 standard; supported by two ends; separately placed on pump's two ends; water cooled, thin oil lubricated; high rigidity main axis; high precision dynamic tested

Mechanical seal: API682standard sized cartridge mechanical seal and relevant seal auxiliary system

Wearing ring: anti-adhesive material made

Performance parameters

Flow：40 m^3/h to 600 m^3/h
Head：500 m to 2850 m
Temperature：to 210 ℃
Pressure：to 28 MPa
Speed：2950 r/min

Vertical Barrel Pump

HVS API610 vertical split barrel casing pump is a single stage or multistage vertical section pump with radial guide vane or diversion shell structure. Vertical barrel pump as it means is vertically outlaid with double barrels underground when being fixed. For this pump, its shaft (or barrel length) is decided by NPSH requirement. As NPSHa parameter changes, the shaft will be adjusted accordingly. The pumps are suitable for small NPSHa working conditions, petrochemical industries, coal chemical industries and liquefied gas engineering.

Design Feature

Executive standard: API610

Structure Pattern: VS6

Structure feature: vertical barrel type; double-casing structure; section structure in internal casing; application of spigot between sections

Force balance design: guide vane collects liquid from impeller; for multistage pump, balance drum or combined with balance disc is used to adjust axial force balance

Design Feature

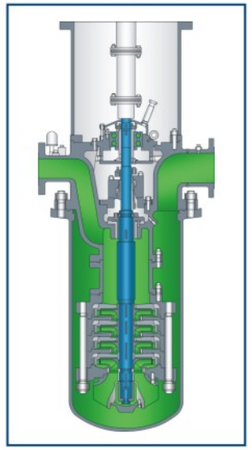
Bearing design: independent bearing house; thin oil lubrication; oil level control; rotor axial thrust is born by in-house thrust bearing parts; multiply high-wearing self-lubricating bearings inside long axial

Mechanical seal: sized according to API 682 standard; available for different mechanical seals and seal auxiliary systems

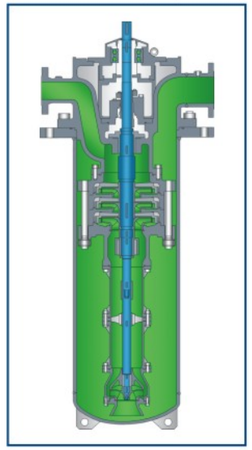
Performance parameters

Flow：8 m^3/h to 2600 m^3/h
Head：9 m to 1000 m
Temperature：-40℃ to 180℃
Pressure：to 11 MPa
Speed：to 3600 r/min

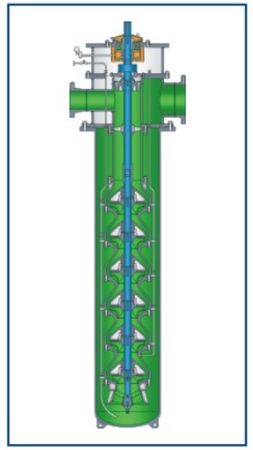
HVS-A (VS6)



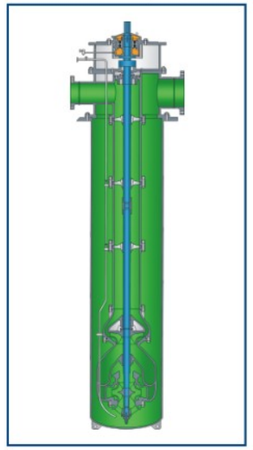
HVS-B (VS6)



HVS-A-L (VS6)



HVS-B-S (VS6)



Double-casing Multistage Pump

Double-casing Pump (HTD) is a horizontal multistage centrifugal pump with outer barrel. It is designed in BB5 structure, supported by central line and can be split in radial direction. This pump is used in high temperature & high pressure working conditions or hazardous liquid transport, such as boiler feed water, oil product refining, hydrogenation feeding, radiation furnace feeding, continues reforming in high pressure, oilfield injection, hydraulic decoking, etc.

Design Feature

Executive standard: API610

Structure Pattern: BB5

Casing design: pressure cylindrical casing with pump inlet and outlet on outer cylinder; volute metal spiral wound gasket; using central line installing feet; containing supports for bearing housings

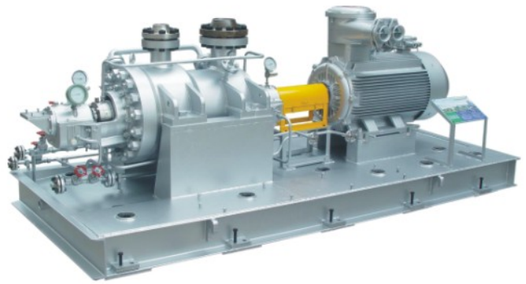
Inner core: mainly composed by hydraulic part; whole core-pulling design pattern

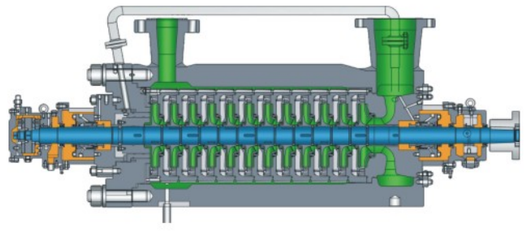
Impeller: precision casted and polished; first stage designed for good cavitation performance, second stage for high efficiency; application of CFD analysis and optimization

Inner housing: composed by radial split segments; application of high precision spigots; guided vane as energy harvesting and medium guide;

Force balance design: inset guided vane; using balance drum to balance axial thrust;

High-speed Bearing: optimized tilting bearing or rolling bearing for option





Performance parameters

Flow：8 m^3/h to 1000 m^3/h

Head：300 m to 3000 m

Temperature：to 450 ℃

Pressure：to 28 MPa

Speed：2950～6400 r/min

Double-casing Multistage Self-balancing Pump

The Pump (HTDB) is a horizontal multistage centrifugal pump with outer barrel. It is designed in BB5 structure, supported by central line and can be split in radial direction. This pump is used in high temperature & high pressure working conditions or hazardous liquid transport, such as boiler feed water, oil product refining, hydrogenation feeding, radiation furnace feeding, continues reforming, ammonia & methylamine transport in high pressure, oilfield injection, hydraulic decoking, etc.

Design Feature

Executive standard: API610

Structure Pattern: BB5(new type)

Casing design: pressure cylindrical casing with pump inlet and outlet on outer cylinder; volute metal spiral wound gasket; using central line installing feet; containing supports for bearing housings

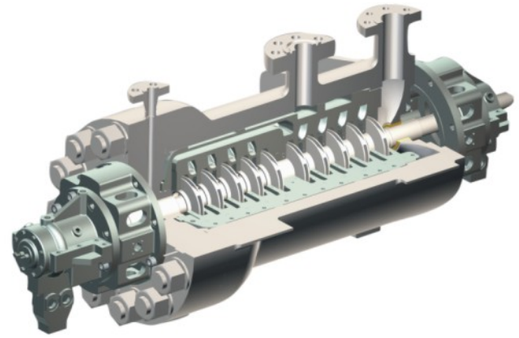
Inner core: mainly composed by hydraulic part; whole core-pulling design pattern

Impeller: precision casted and polished; first stage designed for good cavitation performance, second stage for high efficiency; application of CFD analysis and optimization

Inner housing: axial middle split design; liquid passage type of inset guided vane

Force balance design: inset guided vane; using back-to-back contraposition impeller to balance axial thrust

High-speed Bearing: optimized tilting bearing or rolling bearing for option



Performance parameters

Flow：8 m^3/h to 1000 m^3/h

Head：300 m to 3000 m

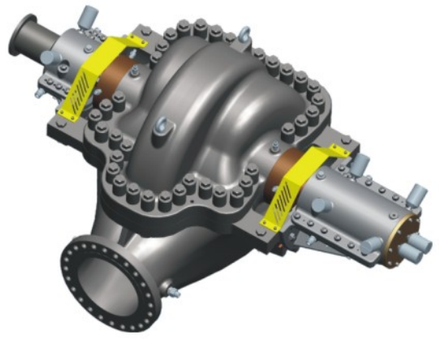
Temperature：to 450 ℃

Pressure：to 42 MPa

Speed：2950～8000 r/min

Hydraulic Turbine

Hydraulic turbine is an engine that takes excessive pressure in petroleum, chemical, fertilizer devices and converts it into mechanical energy. As per API610 standard, we have structured it in single stage cantilever type and double support type.



Design Feature

Executive standard: API610

Structure pattern: BB1/BB2/BB3/BB4/BB5

Design reference: radial hydraulic turbine theory and actual working condition

Options for unit configuration: overrun clutch, over speed protector, automatic control regulating system, etc.

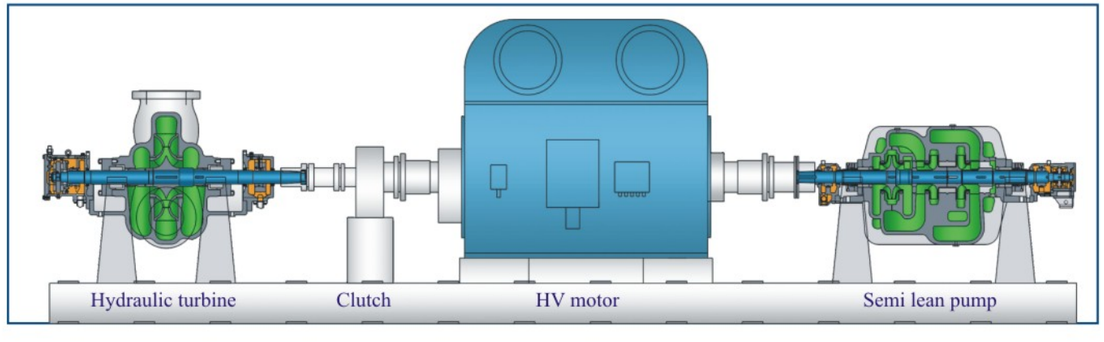
Performance parameters

Flow：to 18000 m^3/h

Head：to 3000 m

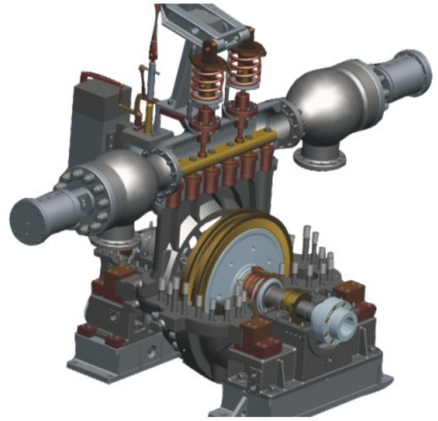
Temperature：−40℃ to 450 ℃

Pressure：to 35 MPa



Industrial Steam turbine

Dalu industrial turbine, designed conformity with API611, 612 standards, is a steam turbine used as industrial equipment driver. It is mainly applied in the industries as petrochemical industries, coal chemical industries, fertilizer, metallurgy, electric power, papermaking, etc. to drive pump, compressor, air blower or drive generator to recover waste heat. We have three kinds of such product: back-pressure turbine, condensing turbine and condensing turbine with extraction.



Design Feature

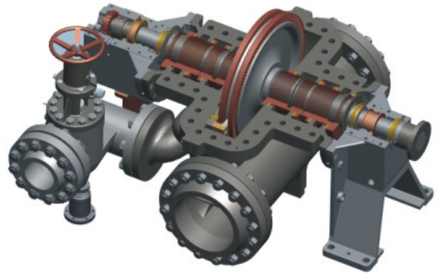
Executive standard: API611 & API612

Cylinder: Adoption of sliding key system

Regulating & control system: high precision; can meet NEMA D degree requirement

Options for seal structure: carbon ring type, labyrinth type, labyrinth + carbon ring type, honeycomb type

Product feature: small, compact, anti-wearing, low vibration noise, easy for maintenance, etc



Performance parameters

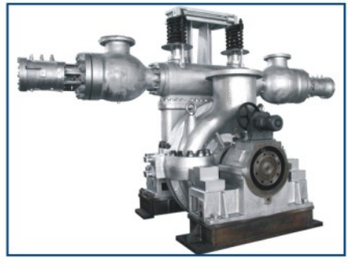
Output power：15 kW to 25000 kW

Max speed：18000 r/min

Inlet pressure：0.6 MPa to 8.9 MPa

Inlet temperature：180℃ to 550 ℃

Outlet pressure：to 2.6 MPa



Turbine Driven Pump Unit

Over past 10 years, Hangzhou Dalu has been dedicated in developing pump and turbine, especially in optimizing unit shafting, thermal expansion, speed selection and unit installation. The company have succeeded in providing API standardized unit that possesses both pump and turbine characteristics. By now, it has supplied the unit to petrochemical industries, coal chemical industries, chemical fertilizer, metallurgical industries, electric power and military industries, where we have got many thanks.

Design Feature

Executive standards: API610 for pump; API611 & API612 for turbine

Turbine type: back pressure type, condensing type, back pressure type with extraction, condensing type with extraction, etc.

Pump structure pattern: OH1/OH2/BB1/BB2/BB3/BB4/BB5

Unit selection: according to actual working condition

After service: one-top service for all pumps and turbines

Design concept: perfectly match pump to turbine

Steam turbine & OH1 Pump

Steam turbine & OH2 Pump

Steam turbine & BB1 Pump

Steam turbine & BB2 Pump

Steam turbine & BB3 Pump

Steam turbine & BB5 Pump

SERVICE CONCEPT

Hangzhou Dalu offers pump and turbine service to all kinds of global industries, services such as equipment status remote monitoring and fault diagnosis by IOT, spare part preparation & sale, professional filed service engineer, etc. If you choose our products, expect them in good working condition and constant improvement.

- ☐ Intervening precaution and analysis
- ☐ Global spare part warehouses
- ☐ 24-hour quick response service
- ☐ Professional engineering service team
- ☐ comprehensive and innovative solution offering

Our International Customer

Our China Customer

中国石油天然气集团公司 CHINA NATIONAL PETROLEUM CORPORATION

中国大唐集团公司 China Datang Corporation

WISON

中国石油化工股份有限公司 CHINA PETROLEUM & CHEMICAL CORPORATION

新疆广汇实业投资（集团）有限责任公司 XINJIANG GUANGHUI INDUSTRY INVESTMENT GROUP CO.,LTD

BASF The Chemical Company

中国海洋石油总公司 CHINA NATIONAL OFFSHORE OIL CORP.

浙江巨化股份有限公司

陕西延长石油(集团)有限责任公司 SHAANXI YANCHANG PETROLEUM(GROUP)CO.,LTD.

湖北宜化集团有限责任公司 HUBEI YIHUA GROUP LIMITED LIABILITY COMPANY

赛科 SECCO

中国石化工程建设公司 SINOPEC ENGINEERING INCORPORATION

内蒙古庆华集团 INNER MONGOLIA QINGHUA GROUP

神华集团有限责任公司 SHENHUA GROUP CORPORATION LIMITED

中国中化集团公司 SINOCHEM GROUP