



山东章鼓 股票代码: 002598

山东省章丘鼓风机股份有限公司

SHANDONG ZHANGQIU BLOWER CO.,LTD.

江苏章鼓力魄锐动力科技有限公司

JIANGSU ZHANGGU LIPORI TECHNOLOGY CO.,LTD.



山东省济南市章丘区明水经济开发区世纪大道东首

ADD: SHIJI BLVD. EAST, MINGSHUI ECONOMIC ZONE, ZHANGQIU DISTRICT, JINAN CITY, SHANDONG PROVINCE



联系电话 / 8325 0982

力魄锐市场部

LIPORI MARKETING DEPARTMENT

联系电话 / 8325 0025

8325 0036

销售公司

SALES COMPANY



<http://www.blower.cn>



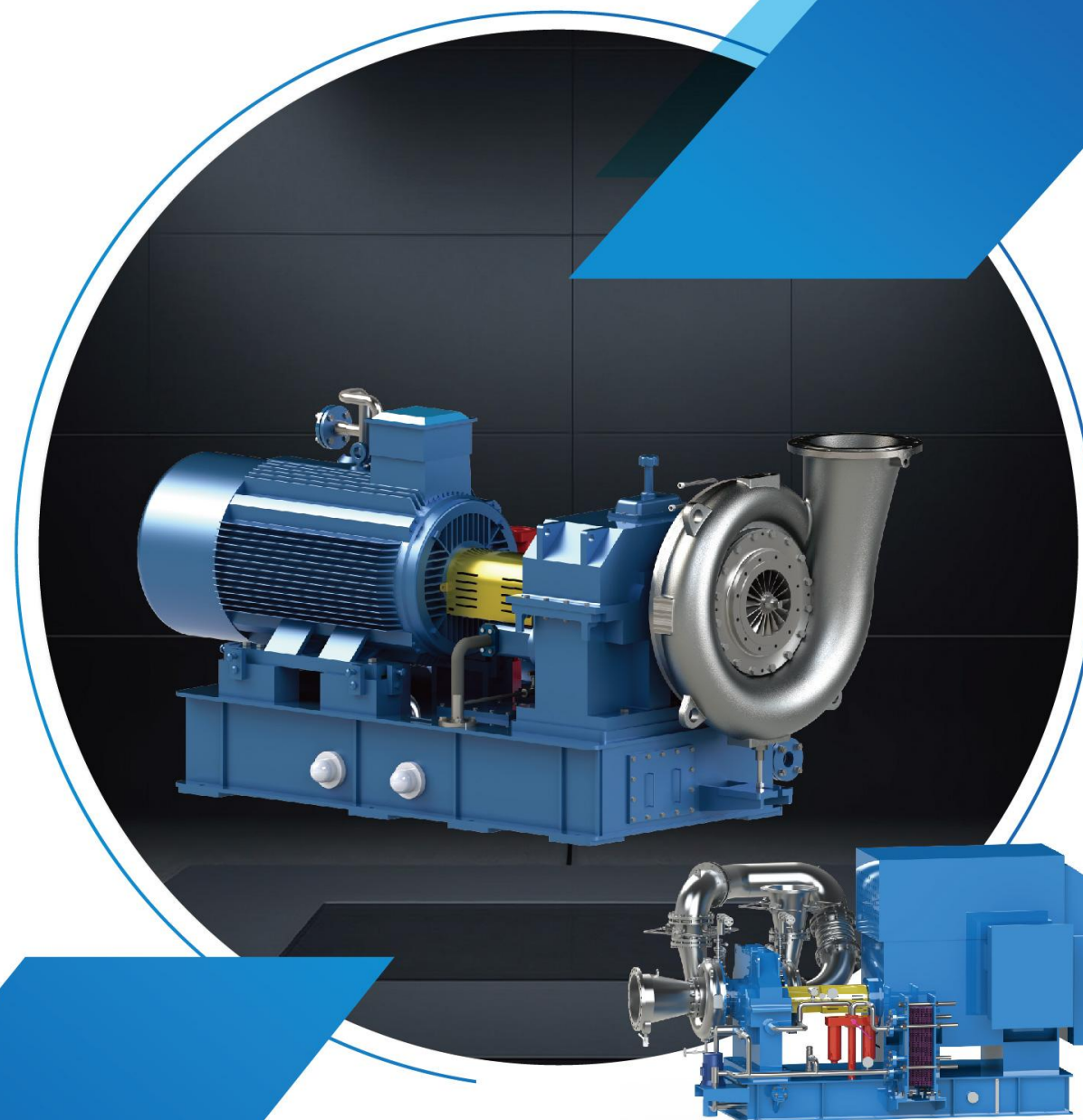
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高速离心式蒸汽压缩机

HIGH SPEED CENTRIFUGAL STEAM COMPRESSOR

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山东章鼓



High Speed Centrifugal Steam Compressor

一流的产品品质
永不停止创新
为社会和用户创造价值

INDEX 目录

章鼓简介	Company Profile	01
章鼓力魄锐简介	Introduction to Jiangsu Zhanggu Lipori Technology Co.,Ltd	03
企业荣誉	Eeterprise Honor	04
产品特点	Product Character	05
主要结构	Main Structure	06
润滑系统	Lubrication System	07
同步电机及驱动器	Synchronous motors and drives	09
监测控制系统	Monitoring And Control System	10
智能云平台——章鼓云	Intelligent Cloud Platform "Zhanggu Cloud"	11
CBV 高温升蒸汽压缩机	CBV High Temperature-rise Steam Compressor	12
CBV 系列产品图谱	CBV series Product Map	13
CCV 高压蒸汽压缩机	CCV High Pressure Steam Compressor	15
CFV 低温升蒸汽压缩机	CFV Low Temperature-rise Steam Compressor	19

SHANDONG ZHANGQIU BLOWER CO.,LTD



企业简介 Company Profile

股票代码 : 002598

山东省章丘鼓风机股份有限公司是国家重点风机生产企业，具有五十余年的风机设计、生产、制造技术和经验。公司占地面积约 43 万平方米，职工 1400 余人。公司先后建立了两家中日合资企业，并在美国设立了分公司，成为国内风机行业第一家在国外建立分公司的企业。目前公司已成为集罗茨鼓风机、离心风机、工业泵、重型机械设备、气力输送成套系统、电气设备、MVR 蒸发浓缩与结晶技术和成套系统、环保水处理产品及服务等产品设计、生产、销售于一体的现代化企业。并成功在深交所挂牌上市。（山东章鼓，股票代码：002598）

公司拥有享受国务院特殊津贴、省、市政府津贴专家、工程技术研究员、“泰山学者”、“泉城学者”、济南市“5150”工程引进的日本专家博士组成的强有力的研发队伍。2017 年公司与水利部水利水电科学研究院水资源所王浩院士合作建立了“山东省院士工作站”。公司先后与清华大学、西安交通大学、浙江大学、中国矿业大学、山东大学等高等院校保持着密切的合作关系。公司自主研发了多项具有国际领先和先进水平的新产品，拥有国内一流的产品研发设计中心，建有省级企业技术中心，具有雄厚的设计、科研、开发、试验、检测的能力，处于国内机械行业领先地位。

章鼓公司是大型罗茨鼓风机专业生产厂家，中国通用机械风机协会副理事长单位，罗茨鼓风机国家标准起草单位。先后荣获“中国机械 500 强企业”、“全国风机、衡器等通用设备制造业”自主创新能力十强、“风机行业”用户满意企业、“山东省机械工业利税五十强企业”、山东省认定的“企业技术开发中心”等多项荣誉称号，是国家高新技术企业。

Shandong Zhangqiu Blower Co., Ltd is one of the most important blower manufacturers in China with 50 years of experience in R & D and production of Roots type blower . The company area :430,000 m2, staff:1400.It has become the largest manufacturer and seller of Roots type blower . It has invested to set up two Chinese - Japanese joint ventures , one sub - company in USA which is the first oversea organization in domestic blowers industry . Now the company has become a large - scale modern producing and design enterprise with products of blowers , heavy - duty equipments , pneumatic conveying systems , industrial pumps and electric equipments , etc .

There are experts who are awarded to enjoy special allowance from the State Council , the Province and the City government , a professional talent from Japan with doctor 's degree in the company and excellent engineering researchers with the title of "TAISHAN ACADEMICIAN" . It also keeps a good and close cooperating relationship with domestic famous universities like Tsinghua University , Xi 'an Jiaotong University , Zhejiang University , Jiangsu University , Shandong University and Shandong University of Science and Technology . The company has a provincial level R & D center with strong ability of research , design , test and inspection and positioning a leading status in domestic machinery industry .

The company is ranked among the top 500 enterprises in Chinese Machinery Industry , the top 10 innovation enterprises in the domestic blower , the top 50 enterprises in taxpaying in Shandong Province . The company is also recognized to be " The Client Satisfaction Enterprises in Blower Industry " . And " The High - Tech . Enterprise " .

1968
创建

50+
经验

2011
上市

ENTERPRISE HONOR

企业荣誉

名彰九州 誉满四海

章鼓人以饱满的激情，辛勤的努力，创造出累累硕果，得到了社会各级、各界的认可，成为章鼓继续前行的动力和跨越发展的标杆。

Renowned in China and all over the world

Zhanggu people is creating fruitful achievements by hard working with full passion that be recognized by all walks of life at all levels of society. This is the power of moving Zhanggu people to go forward and cross the benchmark of development.



LIPORI 力魄锐

江苏章鼓力魄锐动力科技有限公司

江苏章鼓力魄锐动力科技有限公司是山东省章丘鼓风机股份有限公司（上市公司，股票代码：002598，以下简称“山东章鼓”）与杭州力魄锐航空科技有限公司共同投资成立的合资企业。公司位于誉为“太湖明珠”——中国民族工业和乡镇工业摇篮的无锡市，是一家集研发、生产、销售和技术服务为一体的综合型能源动力企业，主要耕耘叶轮机械动力领域，用航空动力技术，服务于民用领域。

公司技术在山东章鼓多年积累的基础上，引进北京航空航天大学专业博士团队，整体研发水平位居行业前列。

公司目前有 CB 系列齿轮箱式离心鼓风机，CBP 系列齿轮箱式工艺气体离心鼓风机，CC 系列齿轮箱式离心压缩机，CVP 系列齿轮箱式离心真空泵，CBV 系列齿轮箱式蒸汽压缩机，CB-D 系列高速永磁直驱鼓风机，CVP-D 系列高速永磁直驱真空泵，CCV 系列高压蒸汽压缩机，CFV 系列低温升蒸汽压缩机等产品，广泛应用新能源、新材料、石油、化工、水处理、电力、钢铁、造纸、铸造、有色冶炼、风洞试验等行业。

INTRODUCTION TO JIANGSU ZHANGGU LIPORI TECHNOLOGY CO.,LTD COMPANY PROFILE

Jiangsu Zhanggu Lipori Technology Co., Ltd is a joint venture between Shandong Zhangqiu Blower Co., Ltd (public company, stock code :002598, abbreviation is " Shandong Zhanggu ") and Hangzhou Lipori Aviation Technology Co., Ltd . The company is located in wuxi , known as the " Pearl of Taihu Lake " - the cradle of national industry and township industry and is a comprehensive energy power enterprise , including research , production , sales and technical services . The main application is in the field of turbo blower machinery power , with aviation power technology , service in the civilian field .

The overall level of research and development is in the forefront of the industry , based on the much experience of Shandong Zhanggu , and the introduction of Beijing University of Aeronautics and Astronautics (Beihang University) professional doctor team .

The company has CB series gearbox centrifugal blower , CBP series gearbox centrifugal blower for process gas , CC series gearbox centrifugal compressor , CVP series gearbox centrifugal vacuum pump , CBV series gearbox steam compressor , CB - D series high - speed permanent magnet direct drive centrifugal blower , CVP-D series high speed permanent magent direct drive vacuum pump , CCV high pressure steam compressor , CFV series low temperature-rise steam compressor , which is widely used in petroleum , chemical industry , water treatment , electric power , iron and steel , paper making , casting , non - ferrous metals , wind tunnel test and other industries .



PRODUCT CHARACTER

产品特点

效率高 叶轮型线先进 定制化设计 节电效果明显

叶轮采用三元流动理论设计，全三维流态仿真，应用流动分析技术预测蒸汽压缩机的性能，使离心蒸汽压缩机绝热效率高达85%。

叶轮根据用户工况参数定制化设计，确保用户需求的工况参数处于叶轮高效区域，更加节能。

流量调节范围宽 运行稳定

蒸发量可通过变频、蒸发温度调节两种方式进行调节，调节范围宽；同时配备防喘振装置可以有效避免压缩机发生喘振。

风机结构紧凑 体积小

采用整体撬装式结构，离心蒸汽压缩机本体组装在齿轮箱的壳体上，润滑油系统、电机及齿轮箱布置在共用底座上，底座兼做油箱，重量轻、占地面积小。

噪音低

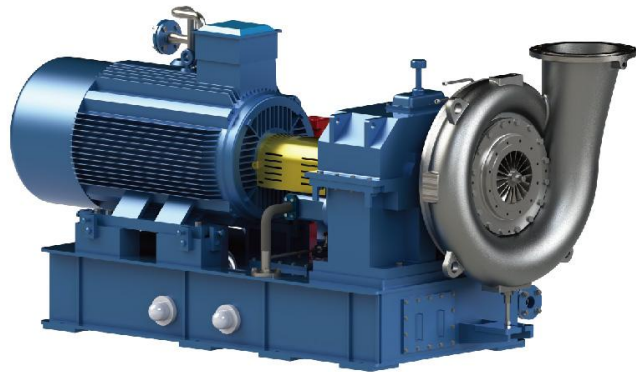
通过先进的蜗壳、叶轮设计技术，抑制离散噪声和宽频噪声，实现对气动噪声的主动控制，更易衰减。

易损件少 安装维护方便

整机易损件少，现场维护量少，安装方便。

智能化程度高

整机的轴承振动、温升，进出口压力、温度，防喘振控制，启停机联锁保护，故障报警，润滑系统油压、油温等一系列监测与控制均采用可编程逻辑控制器控制，同时实时传输到“章鼓云”智能云平台，用户与项目工程师可以实时监控真空泵运行状况。



High Efficiency Advanced Impeller Profile Customized Design , Excellent Power- saving Performance

The impeller is designed by three dimensional flow theory , and the full three dimensional flow simulation . The performance of the steam compressor is predicted by flow analysis technology , and the adiabatic efficiency of the steam compressor can reach about 85% .

The impeller is customized design according to the working parameters of the user to ensure that the working parameters required by the user are in the impeller efficient area , which is more energy saving .

Wide adjust range , stable vacuum degree

Evaporate capacity is wide and can be adjusted by two modes : VFD , Evaporate Temperature ; Anti - surge device is provided to avoid surge problem effectively .

Compact Design , Less Footprint

The overall skid - mounted structure is adopted . Centrifugal steam compressor body is directly connected with gear box casing . The lubricating oil system and the motor are arranged on the common base which serves as the oil tank . Less weight and less footprint .

Low noise level

Through the advanced design technology of spiral case and impeller , the discrete noise and wide - band noise are suppressed , and the active control of aerodynamic noise is realized . More easily decayed .

Less wearing parts , convenient installation and maintenance

Less wearing parts , less site maintenance , easy & fast installation .

High degree of intelligence

The bearing ' s vibration , temperature , the inlet and outlet pressure , temperature , anti - surge control , start - stop interlock protection , fault alarm , lubricating oil pressure , oil temperature and a series of monitoring and control system are controlled by PLC , and real - time transmission to the " Zhanggu Cloud " intelligent cloud platform , users can real - time monitoring equipment running status with project engineer .

MAIN STRUCTURE

主要结构

Impeller

The high efficiency impeller is designed by three dimensional flow theory which is calibrated by static and static balance after strict precision machining and passed the over speed test of 1.15 times the rated speed ensures the impeller strength . In order to meet the requirement of different working conditions of steam compressor , the impeller material can be titanium , duplex stainless steel and other materials .

Volute Casing

Using circular section volute , volute wall profile is designed to be log spiral lines , in line with the law of airflow movement , less impact on the blower . So the blower ' s flow efficiency is high , small vibration , low noise . Volute casing material can be 304,316L,2205,2507 stainless steel according to different working conditions .

High - speed Rotor

The high - speed rotor is consists of the impeller , the high - speed gear and the high - speed shaft . Impeller and high - speed shaft are connected by rod and the torque is transmitted by end surface pin or tooth . The dynamic balancing test accords to the international standards and the precision could reach G1 grade to ensure the operation to be smooth and reliable .

Gear

The acceleration gear pair adopts the involute tooth profile . The surface of gearwheel and pinion gets through the grinding and nitride - harden treatment to maintain the high speed stable operation , low vibration and low noise . The lifetime can be 20 years .

Bearing

The high - speed shaft support , composed by many flexible pads , adopts tilting pad journal bearing . The pads could deflex around the fulcrum , its anti - vibration performance and automatically adjusting ability according to the variation of load and speed are both excellent .

高速类产品部分

叶轮

根据三元流理论设计的叶轮效率高，经严格的精密加工后作动静平衡校正，并通过 1.15 倍额定转速的超速试验，保证了叶轮强度。为了满足蒸汽压缩机不同工况的需求，叶轮材料可选用钛材、双相不锈钢等材料。



蜗壳

采用圆截面蜗壳，蜗壳壁的型线设计成对数螺旋线，符合气流的运动规律，对风机冲击小，因此风机的流动效率高，振动小，噪音低。蜗壳材质根据不同工况可选用 304、316L、2205、2507 等不锈钢。



高速转子

高速转子由叶轮、高速齿轮及高速轴组成。叶轮与高速轴采用拉杆连接，靠端面销或端面齿传递扭矩。为了确保风机运行平稳可靠，高速转子整体平衡精度达 G1 级。



齿轮

增速齿轮对为渐开线齿形，大小齿轮表面均经过研磨，渗氮硬化处理，保证风机高速运转稳定，振动和噪声小，寿命可达 20 年。



轴承

高速轴支承采用可倾瓦滑动轴承，由多块可绕支点偏转的活动瓦块组成，其抗振性能优良，并可根据载荷和转速的变化自动调节。

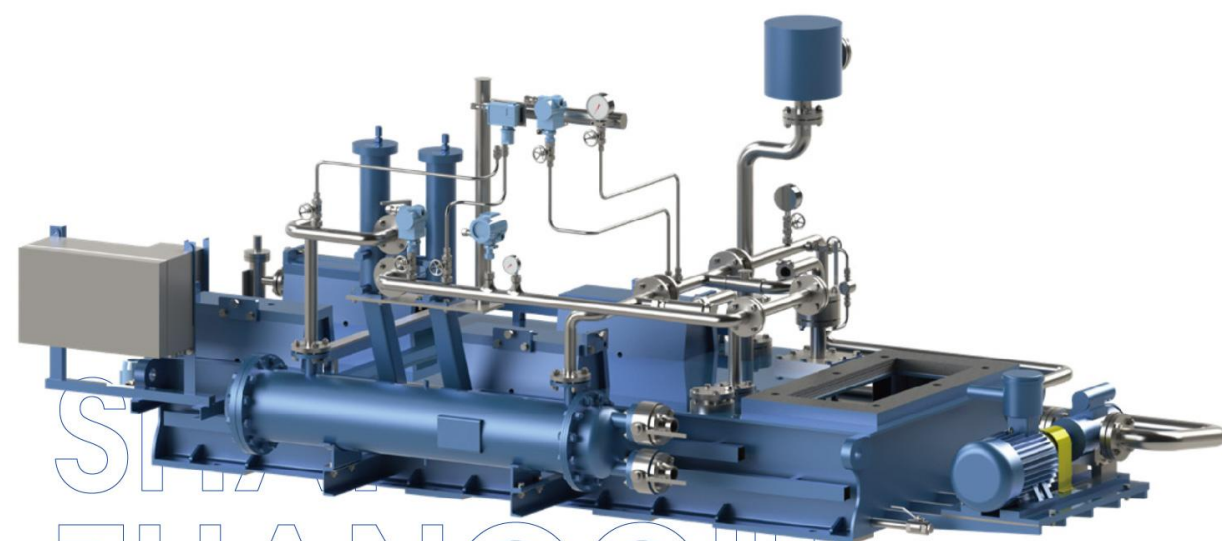


LUBRICATION SYSTEM

润滑系统

润滑系统分油箱及润滑油路两部分。机组底座兼作油箱，内设浸入式电加热器和温控开关，以保证润滑油的温度。润滑油路由主油泵、辅助油泵、双桶过滤器、换热器等组成，主油泵由低速齿轮驱动，机组运行正常时可提供一定压力的润滑油润滑齿轮和轴承；电动泵在机组启动前为系统提供预润滑，在紧急情况和停机过程中保持油压，起备用油泵作用。油过滤器过滤精度高，并配置过滤器压差过高报警装置。

The lubrication system consists of the oil tank and the oil pipeline. The pedestal doubles as an oil tank, the immersion-type electric heater and temperature control switch are both included in the oil tank. Lubrication piping is composed by: master oil pump, auxiliary oil pump, binocular filter and heat exchanger. The main oil pump would be driven by the low-speed gear and it supplies the pre-lubrication to gear and bearing with certain pressure when the units operate normally. The electric pump would supply the pre-lubrication before the units start and keep the oil pressure still under the emergency and downtime. The electric pump also plays a role of stand-by oil pump. The oil filter with double cylinder is high-precision. The pressure difference alarm device on filter is also equipped.



SHANGHAI
ZHANGQIU
BLOWER CO., LTD

通用部分

密封

根据工况需求，蒸汽压缩机有多种密封形式的选择，常规有迷宫充蒸汽、碳环密封充蒸汽、干气密封等。

密封充汽装置

密封充汽装置可用于负压或常压工况的蒸汽压缩机，将过热蒸汽充入轴封内，以防止空气向压缩机内泄露。充汽装置包括蒸汽减压阀、压力检测装置、不锈钢过滤器等。对于正压工况的蒸汽压缩机，通常采用放空或抽汽等泄压方式，防止外露蒸汽进入齿轮箱，造成润滑油乳化。

减温水喷淋装置

多支高压雾化喷头，环向分布，改善水雾在管内分布均匀性，提高雾化效率。个别喷头出现堵塞或其他异常状况时，其余喷头仍可保证足够的喷水量。进水口配备有不锈钢减压阀（可选择手动或自动形式）及过滤器。

疏水罐

用于收集和排放机组中产生的液态水，可根据实际需求设计为负压、常压、正压三种形式。罐体上带有进水阀门（可选择手动或自动形式）、观察视镜、液位计（可选就地或远传）、排水阀等附件。如果同时配备自动排水阀或排水泵（负压工况）及远传液位计，可实现全自动排水、液位实时监测、异常报警等功能。

Seal

According to the requirements of working conditions, diverse options of sealing are available for the steam compressor, the standard options: labyrinth seal with steam purging, carbon ring sealing with steam purging, dry gas seal, etc.



Sealing Steam Charging Device

Sealing Steam Charging Device is used for negative pressure or normal working condition steam compressor, it charges the superheated steam into shaft seal to prevent the air leakage into compressor. The steam charging device includes steam pressure relief valve, pressure detection device, stainless steel filter and etc. For steam compressors under positive pressure conditions, pressure relief methods such as blow-off or steam extraction are usually used to prevent exposed steam from entering the gearbox, resulting in emulsification of lubricating oil.



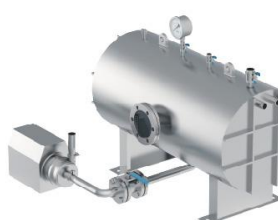
Desuperheating Water Spray Device

Annular distributed multiple high-pressure atomizing nozzles improve the distribution uniformity of water mist in the pipe and increase the atomization efficiency. When any individual nozzle is blocked or other abnormal conditions, the remaining nozzles can still ensure sufficient spray volume. The inlet is equipped with a stainless steel pressure relief valve (manual or automatic option) and filter.



Drainage Tank

Used for collecting and discharging the liquid water generated from blower unit. It can be designed negative pressure, normal pressure or positive pressure three modes as per actual requirement. Tank body is equipped with inlet valve (manual or automatic option), sight glass, liquid level gauge (local or remote transmission) and drainage valve and etc accessories. If it is equipped with automatic drainage valve or drainage pump (negative pressure condition) and remote transmission liquid level gauge, automatic drainage, real-time monitoring of liquid level, abnormal alarm and other functions can be realized.



SYNCHRONOUS MOTORS AND DRIVES

同步电机及驱动器

电机

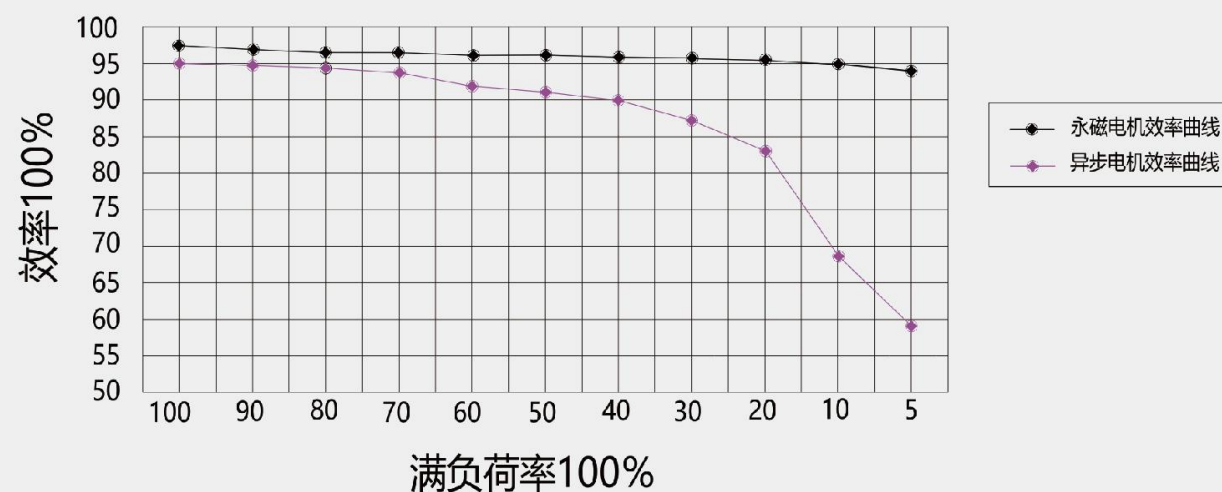
推荐采用永磁同步电机（永磁同步低速或永磁同步高速），效率高，满足 GB30253-2013 标准的 1 级能效等级，额定运行效率 94.5-97%，高于异步电机 4-6%，结构简单，尺寸更小，噪音更低，节能效果更佳。

Motor

Recommend to use permanent magnet synchronous motor of high efficiency meets the grade 1 energy efficiency grade of GB30253-2013 standard . Its rated operating efficiency is 94.5-97%,4-6% higher than asynchronous motor . Simple structure , smaller size , lower noise , better energy saving performance .



永磁同步变频电机与异步变频电机效率曲线对比图



MONITORING AND CONTROL SYSTEM

监测控制系统

监测控制系统是专门为监控离心式蒸汽压缩机运行设计制造的，该系统具备启动条件连锁、防喘振控制、轴承温度过高和轴承振动过大保护等功能。对于高速离心蒸汽压缩机在供油管路上配有油压传感器，可控制辅助油泵自动启停；在冷却器后配有油温传感器，高速滑动轴承配有测温、测振传感器，压缩机进出口管路配有测量温度、压力的一次、二次仪表及变送器，这样，可实时监测各种运行参数，保证压缩机安全、稳定、可靠的运行。

The monitoring and control system are designed for protecting running of high - speed centrifugal blower . The startup is provided with the mode of interlock , anti - surge control , the accessorial pump automatic start & stop according to the oil pressure , protection for over high bearing temperature and vibration . There are oil pressure sensors on oil - supplying pipeline , oil temperature sensors following oil coolers , temperature sensors and vibration sensors on high speed sliding bearings . The inlet and outlet pipeline are equipped with primary & secondary meters and transmitter to measure air temperature & pressure , so that , it can monitor the parameters real - time , to ensure the safe , stable and reliable operation of the blower .



INTELLIGENT CLOUD PLATFORM “ZHANGGU CLOUD”

智能云平台——“章鼓云”



云计算在企业数字化中盛行，云计算使信息系统资源实现了资源按需分配的灵活性和可伸缩性，更有效地实现企业信息系统的技术标准化和管理规范化，为企业信息系统提供更好的支持。

章鼓云利用先进的云技术实现大量设备上网通信、数据传输、云计算、远程运维等功能，可以实时查看设备数量、分布情况、故障报警信息、运行历史记录等。可以通过实时数据来确定故障的具体信息，为客户提出更精确的解决方案，为派遣相应的售后人员提供参考。故障报警也可以随时查询，同时支持短信报警和微信报警，及时推送，使工程师第一时间了解设备运行状态。

Cloud computing prevails in enterprise digitization. Cloud computing enables the flexibility and scalability of on-demand resource allocation of information system resources, more effectively realizes the standardization of technology and management of enterprise information system, and provides better support for enterprise information system.

Zhanggu Cloud uses advanced cloud technology to realize a large number of equipment network communication, data transmission, cloud computing, remote operation and maintenance functions, and can view the number of equipment, distribution, fault alarm information, operation history records, etc. You can use real-time data to determine specific fault information, propose more accurate solutions for customers, and provide reference for corresponding after-sales personnel. Fault alarm can also be queried at any time, while supporting SMS alarm and wechat alarm, timely push, so that engineers can know the operating status of the device in the first time.



远程透传PLC程序

可以实现远程PLC程序下载、上传和监控，足不出户便可解决现场问题。



数据远程监控

可以通过网页或者手机APP实现设备数据监控，第一时间了解设备运行状态、修改参数等。



设备报警推送

可以通过短信、微信、语音等多种方式，第一时间推送设备故障状态，及时掌握设备运行状态。



历史数据查询

可以查询保存和设备的历史数据，可以通过曲线或表格形式展示，并且可以导出至本地。



数据统计和分析

可以统计设备的能耗数据、故障率等，对设备进行有效的考核和统计，便于研发、售后、销售等不同部门进行分析。

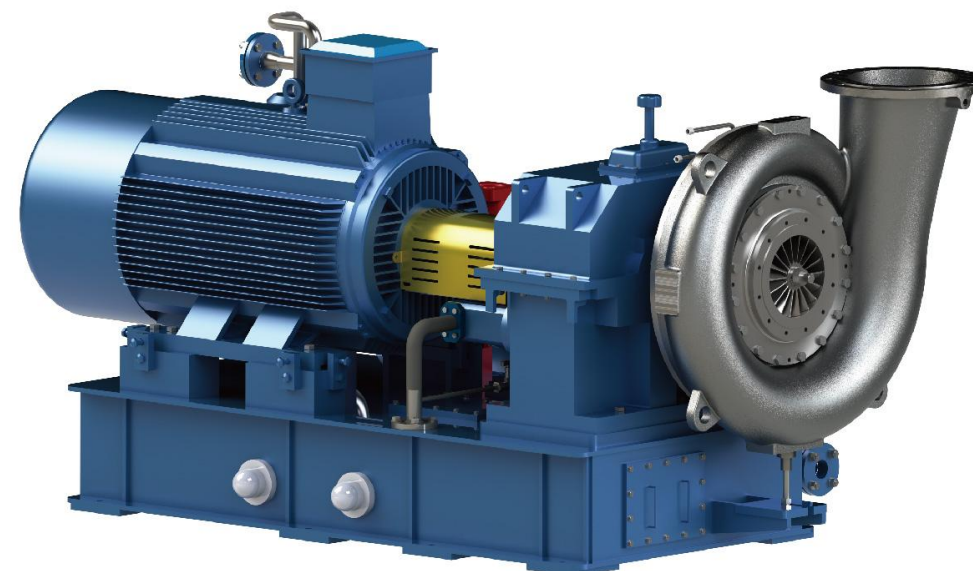


提升售后服务效率

可以通过物联网平台，提升售后服务效率。

CBV HIGH TEMPERATURE-RISE STEAM COMPRESSOR

CBV 高温升蒸汽压缩机



CBV 系列高温升离心蒸汽压缩机是在山东省章丘鼓风机股份有限公司多年积累经验的基础上，引进北京航空航天大学专家团队，开发出的新一代高效节能产品。

该系列产品气动性能和结构设计均达到国内外领先水平，根据现场工况定制化设计，可广泛应用于各类 MVR 系统及相关行业。

CBV High Temperature-rise Steam Compressor is newly developed product of high efficiency and power-saving based on the years' experience of Shandong Zhangqiu Blower Co., Ltd and the introduction of Beijing University of Aeronautics and Astronautics (Beihang University) professional doctor team.

The pneumatic performance and structural design of this series product has reached the leading level in China and abroad, customized design according to the field conditions, can be widely used in MVR system steam compression, steam positive pressure transportation and etc industries.

高温升蒸汽压缩机命名规则

例：CBV 8.0-90/117-2D

- 1、CBV 表示蒸汽压缩机；
- 2、8.0 表示蒸发量，单位 t/h；
- 3、90 表示蒸发温度（即入口饱和温度），单位℃；
- 4、117 表示出口饱和温度（蒸发温度+饱和温升），单位℃；
- 5、2 表示两级机头串联，无则默认为单机头；
- 6、D 表示直接驱动，无则默认为齿轮箱驱动。

Steam Compressor Naming Rule:

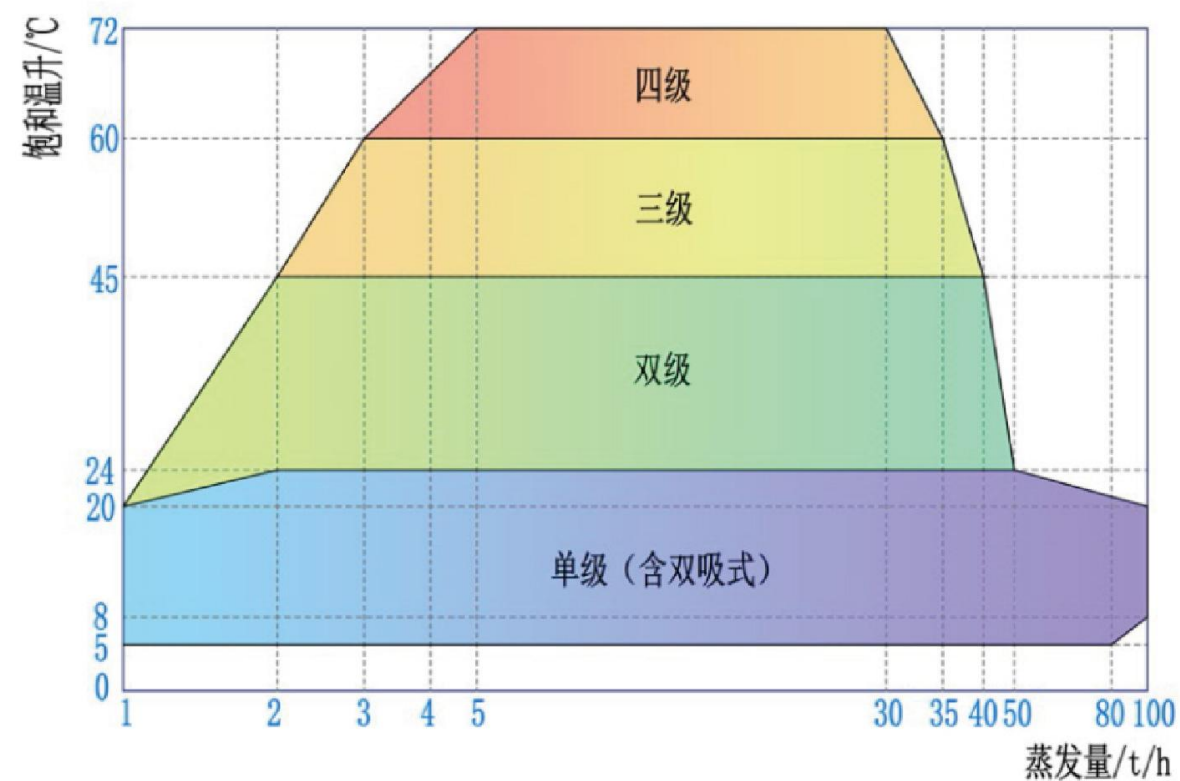
Example: CBV 8.0-90/117-2D

- 1、CBV: Steam Compressor;
- 2、8.0 means Evaporate Capacity, unit: t/h;
- 3、90 means Evaporate Temperature: Suction Saturated Temperature, Unit: °C;
- 4、117 means Discharge Saturated Temperature (Evaporate Temperature + Saturated Temperature Rise), Unit: °C;
- 5、2 means Double stage in series, Null means single stage;
- 6、D means Direct Drive, Null means driven by gear box.

CBV SERIES PRODUCT MAP

CBV 系列产品图谱

CBV 系列蒸汽压缩机图谱

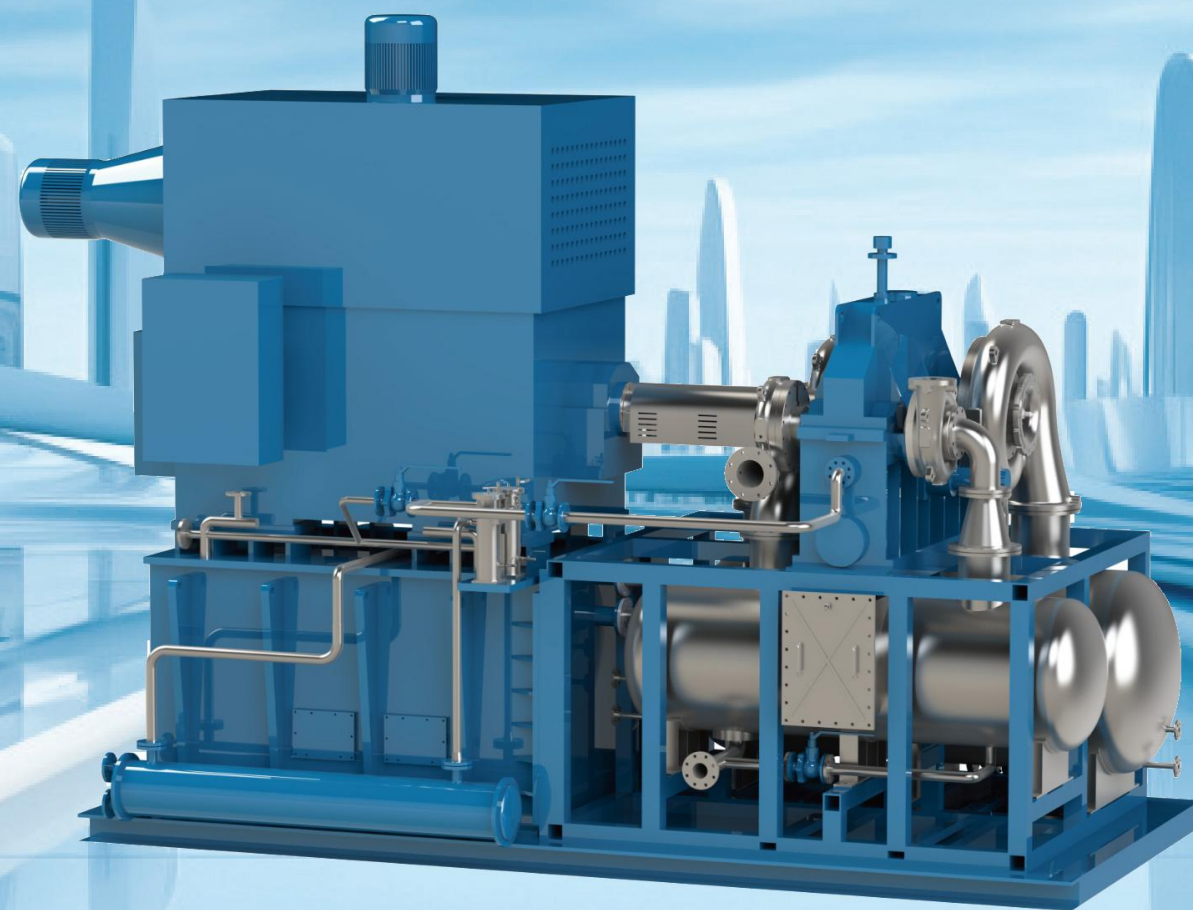


以上范围针对蒸发温度 80~100°C
低温或高温蒸发的情况对蒸发量适用范围有一定影响，详询章鼓力魄锐。



CCV HIGH PRESSURE STEAM COMPRESSOR

CCV 高压蒸汽压缩机



高压蒸汽压缩机命名规则

例: CCV10-0.55/1.25-2D

- 1、CCV 表示蒸汽压缩机;
- 2、10 表示入口蒸汽流量, 单位 t/h;
- 3、0.55 表示入口绝对压力, 单位 MPa(A);
- 4、1.25 表示出口绝对压力, 单位 MPa(A);
- 5、2 表示两级串联压缩, 缺省则默认为单机头;
- 6、D 表示直接驱动, 缺省则为齿轮箱驱动。

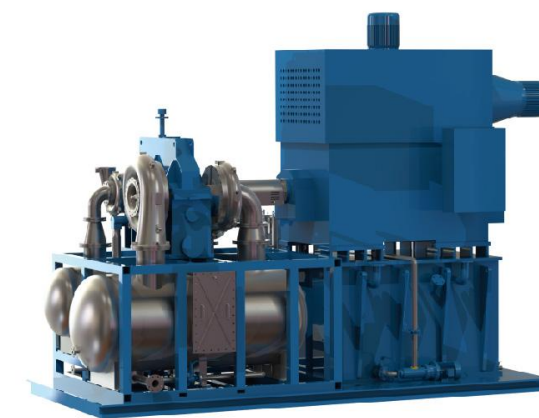
Steam Compressor Naming Rule:

Example: CCV10-0.55/1.25-2D

- 1、CCV: Steam Compressor;
- 2、10 means Suction Steam Flow Capacity, unit: t/h;
- 3、0.55 means Suction Absolute Pressure, unit: Mpa (A);
- 4、1.25 means Discharge Absolute Pressure, unit: Mpa (A);
- 5、2 means Double stage in series, Null means single stage;
- 6、D means Direct Drive, Null means driven by gear box .

PRODUCT CHARACTER

产品特点



1、CCV 系列高压蒸汽压缩机是为了适应节能减排大环境下的市场需求, 针对工厂管道蒸汽增压、乏汽增压、余热回收等工况而开发出的新一代产品。

2、多级压缩机级间配置不锈钢高效汽水分离器, 可防止减温水喷水过量导致汽化不充分, 进而损伤下一级叶轮。汽水分离器具备自动排水功能。

3、主机及级间分离器采用整体撬装式结构, 结构紧凑, 安装便捷。

4、采用耐高压不锈钢铸造蜗壳, 承压和密封性能好。

5、采用多级分组碳环结构, 实现了对高压蒸汽的节流、减压、阻封、隔离等功能, 有效防止蒸汽外泄威胁齿轮箱运行安全和对环境造成影响。密封碳环结构加固, 应对工况的波动能力更强。

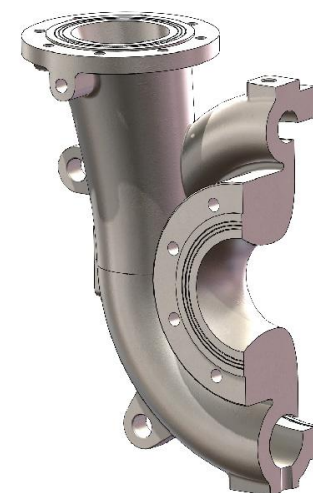
1、CCV Series High Pressure Steam Compressor is a new generation product to meet the market requirement of energy saving, especially for the sections of factory pipe steam boosting, exhausted steam boosting, waste heat recovery, etc.

2、The stainless steel high-efficiency steam separator is provided between stages of the multistage centrifugal compressor to prevent insufficient vaporization caused by excessive water spraying of desuperheating water which may damage the next stage impeller. Steam separator with automatic drainage function.

3、Bare shaft blower and inter-stage separators are integrated skid mounted, compact structure, convenient installation.

4、The high-pressure version of the stainless steel casting volute is adopted, which has good pressure bearing and sealing performance.

5、Adopt multi-stage grouped carbon ring structure to achieve the function of throttling, decompression, blocking and isolation of high pressure that prevent the steam leakage may affect safely running of Gear Box and impact the environment. Reinforced carbon ring seal takes better adaption capability on working condition floating.



产品选型参数表
Product Sizing Data Table

单级压缩机 Single Stage Compressor							
型号	进口压力 MPaA	进口温度℃	流量 t/h	出口压力 MPaA	总压比	轴功率 kW	电机功率 kW
CCV5-0.6/0.8	0.6	158.9	5	0.8	1.33	118	132
CCV5-0.6/0.9	0.6	158.9	5	0.9	1.50	168	200
CCV5-0.6/1.0	0.6	158.9	5	1.0	1.67	218	250
CCV10-0.6/0.8	0.6	158.9	10	0.8	1.33	216	250
CCV10-0.6/0.9	0.6	158.9	10	0.9	1.50	310	355
CCV10-0.6/1.0	0.6	158.9	10	1.0	1.67	398	450
CCV10-0.6/1.1	0.6	158.9	10	1.1	1.83	484	560
CCV20-0.6/0.8	0.6	158.9	20	0.8	1.33	398	450
CCV20-0.6/0.9	0.6	158.9	20	0.9	1.50	572	630
CCV20-0.6/1.0	0.6	158.9	20	1.0	1.67	737	800
CCV20-0.6/1.1	0.6	158.9	20	1.1	1.83	893	1000
CCV20-0.6/1.2	0.6	158.9	20	1.2	2.00	1044	1250
CCV50-0.6/0.8	0.6	158.9	50	0.8	1.33	929	1000
CCV50-0.6/0.9	0.6	158.9	50	0.9	1.50	1333	1600
CCV50-0.6/1.0	0.6	158.9	50	1.0	1.67	1712	2000
CCV50-0.6/1.1	0.6	158.9	50	1.1	1.83	2077	2250
CCV50-0.6/1.2	0.6	158.9	50	1.2	2.00	2427	2800
CCV100-0.6/0.8	0.6	158.9	100	0.8	1.33	1812	2000
CCV100-0.6/0.9	0.6	158.9	100	0.9	1.50	2606	2800
CCV100-0.6/1.0	0.6	158.9	100	1.0	1.67	3347	3550
CCV100-0.6/1.1	0.6	158.9	100	1.1	1.83	4054	4500
CCV100-0.6/1.2	0.6	158.9	100	1.2	2.00	4725	5000

注：以上设计参数范围仅供参考，此范围之外的请详询江苏章鼓力魄锐。
Above designed data range only for reference, any other working point please consult LIPORI.

双级压缩机 Double Stage Compressor								
型号	进口压力 MPaA	进口温度℃	进口流量 t/h	出口流量 t/h	出口压力 MPaA	总压比	轴功率 kW	电机功率 kW
CCV5-0.3/0.6-2	0.3	133.6	5	5.2	0.6	2.00	260	315
CCV5-0.3/0.8-2	0.3	133.6	5	5.2	0.8	2.67	384	450
CCV5-0.3/0.9-2	0.3	133.6	5	5.3	0.9	3.00	442	500
CCV10-0.3/0.7-2	0.3	133.6	10	10.4	0.7	2.33	604	710
CCV10-0.3/0.9-2	0.3	133.6	10	10.5	0.9	3.00	814	900
CCV10-0.3/1.1-2	0.3	133.6	10	10.5	1.1	3.67	991	1120
CCV20-0.3/0.7-2	0.3	133.6	20	20.9	0.7	2.33	1137	1250
CCV20-0.3/0.9-2	0.3	133.6	20	21.0	0.9	3.00	1527	1800
CCV20-0.3/1.1-2	0.3	133.6	20	21.1	1.1	3.67	1856	2000
CCV20-0.3/1.2-2	0.3	133.6	20	21.1	1.2	4.00	2009	2250
CCV50-0.3/0.7-2	0.3	133.6	50	52.2	0.7	2.33	2767	3150
CCV50-0.3/0.9-2	0.3	133.6	50	52.6	0.9	3.00	3701	4000
CCV50-0.3/1.1-2	0.3	133.6	50	52.7	1.1	3.67	4483	5000
CCV50-0.3/1.2-2	0.3	133.6	50	52.8	1.2	4.00	4857	5600

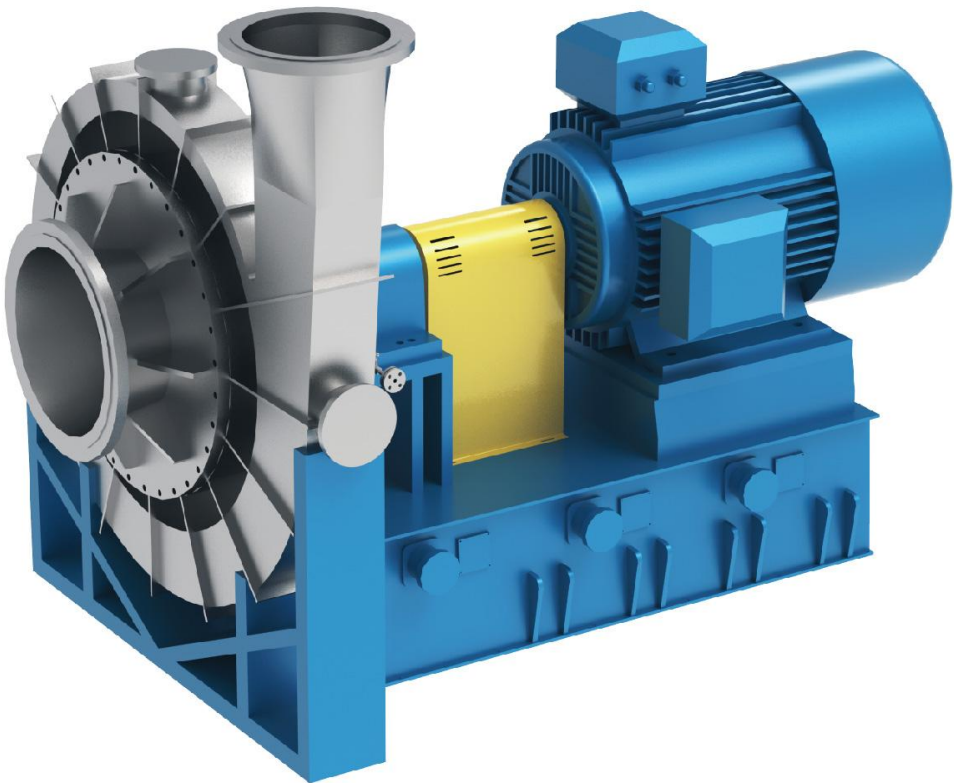
注：以上设计参数范围仅供参考，此范围之外的请详询江苏章鼓力魄锐。
Above designed data range only for reference, any other working point please consult LIPORI.

三级压缩机 Three Stage Compressor								
型号	进口压力 MPaA	进口温度℃	进口流量 t/h	出口流量 t/h	出口压力 MPaA	总压比	轴功率 kW	电机功率 kW
CCV10-0.3/1.2-3	0.3	133.6	10	11.0	1.20	4.00	1035	1250
CCV10-0.3/1.5-3	0.3	133.6	10	11.1	1.50	5.00	1238	1400
CCV10-0.3/1.8-3	0.3	133.6	10	11.1	1.80	6.00	1412	1600
CCV20-0.3/1.4-3	0.3	133.6	20	22.1	1.40	4.67	2224	2500
CCV20-0.3/1.7-3	0.3	133.6	20	22.2	1.70	5.67	2571	2800
CCV20-0.3/2.0-3	0.3	133.6	20	22.3	2.00	6.67	2878	3150
CCV30-0.3/1.4-3	0.3	133.6	30	33.1	1.40	4.67	3262	3550
CCV30-0.3/1.7-3	0.3	133.6	30	33.3	1.70	5.67	3771	4000
CCV30-0.3/2.0-3	0.3	133.6	30	33.4	2.00	6.67	4221	4500

注：1、流量 50t/h 以上的，如需三级压缩，可考虑采用单级 + 双级两台压缩机串联的形式；
2、以上设计参数范围仅供参考，此范围之外的请详询江苏章鼓力魄锐。
1、 For flow capacity above 50t/h cases, consider to mount single stage compressor + double stage compressor in series under the premise of three-stage is required. 2、 Above designed data range only for reference, any other working point please consult LIPORI.

CFV LOW TEMPERATURE-RISE STEAM COMPRESSOR

CFV 低温升蒸汽压缩机



产品特点

Product Character

CFV 系列低温升蒸汽压缩机主要针对饱和温升较低，蒸发量较大的使用工况而开发。该系列压缩机主体部分由闭式焊接叶轮、焊接式蜗壳、叶轮轴、轴承箱、轴端密封、联轴器、永磁同步电机、撬装底座、仪器仪表、稀油润滑系统等构成。

CFV Series Low Temperature-rise Steam Compressor is developed mainly for working conditions of low saturated temperature-rise with huge evaporate volume. This series compressor body is composed of: close style welded impeller, welded volute casing, impeller shaft, bearing box, shaft seal, coupling, PMSM, skid mounted base frame, instruments, thin oil lubrication system and etc.

三元流闭式焊接叶轮

- 叶片、轮盘、轮盖等部分通过模具压制成型。
- 材质：2205、2507、TC4 等，具有良好的耐腐蚀性。
- 强度低于半开式整体铣制叶轮，一般许用线速度 $\leq 300\text{m/s}$ 。

根据转速和负载情况，轴承箱可配置 SKF 滚动轴承或滑动轴承，并配备稀油强制润滑系统，对轴承实施喷油润滑。

此外，CFV 系列低温升蒸汽压缩机同样配备密封充气装置、减温水喷水装置、疏水排凝系统、智能控制系统等，详见前文【主要结构——通用部分】。

Ternary Flow Close Type Welded Impeller

- Blades, impeller disc, impeller cover are formed by compression moulding.
- Material: 2205, 2507, TC4, of good anti-corrosion character.
- The strength is lower than the semi-open integral milling impeller, and the allowable line speed is generally $\leq 300\text{ m/s}$.

Depending on the speed and load, the bearing box can be equipped with SKF rolling bearings or slide bearings, and equipped with a thin oil forced lubrication system to lubricate the bearings with oil injection.

In addition, CFV series Low Temperature-rise Steam Compressor is also equipped with sealing steam charging device, desuperheating water spray device, drainage and condensate drainage system, intelligent control system, etc., see the above [Main structure - General part]



低温升蒸汽压缩机型号命名规则

Low Temperature-rise Steam Compressor Naming Rule:

例：CFV10-90/96

- 1、CFV 表示低温升蒸汽压缩机（低速直驱型）；
- 2、10 表示入口蒸汽流量，单位 t/h；90 表示入口饱和（蒸发）温度，单位 $^{\circ}\text{C}$ ；96 表示出口饱和温度，单位 $^{\circ}\text{C}$ 。

- 1、CFV: Low Temperature-rise Steam Compressor (Low Speed Direct Drive);
- 2、10 Suction Steam Flow Capacity, unit: t/h; 90 Suction Saturated (Evaporate) Temperature, unit: $^{\circ}\text{C}$; 96 Discharge Saturated Temperature, unit: $^{\circ}\text{C}$

典型技术参数范围 Typical Technical Data Range:

系列	蒸发温度 $^{\circ}\text{C}$	蒸发量范围 t/h	饱和温升范围 $^{\circ}\text{C}$
CFV	70	5~80	4~8
CFV	85	8~140	4~9
CFV	100	14~200	4~9