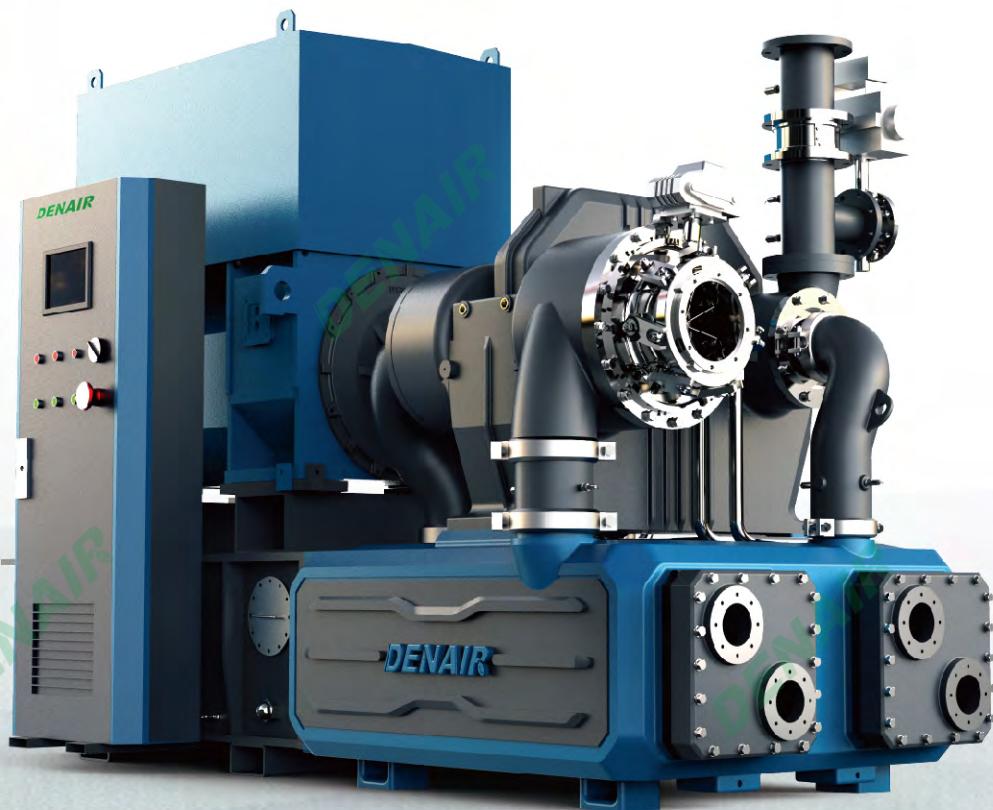


DENAIR

股票代码:870640

离心式压缩机

CENTRIFUGAL COMPRESSOR



德耐尔节能科技（上海）股份有限公司

DENAIR ENERGY SAVING TECHNOLOGY (SHANGHAI) PLC.



德耐尔简介 / Denair Company Profile

德耐尔股份(英文:denair)是一家集研发、制造、直销与服务于一体的大型高新技术企业,于2016年挂牌上市,股票代码:870640。秉持高端·节能·直销的产品与服务定位,德耐尔致力于为中国与全球集团型用户提供工业气体全方位解决方案。

依托位于张江长三角高科技园区的技术研发中心,德耐尔始终确保在中国与全球工业压缩气体领域的技术领先地位,持续为中国与全球高端需求用户提供更节能的工业气体生产力。其产品涵盖离心式压缩机、喷油螺杆空压机、无油空压机、移动式空压机、往复式压缩机、工业真空泵、空气源热泵等七大工业气体应用领域。恪守“节能先行·价值共享”的用户理念,我们确保每一项产品的能效均达到、优于中国一级能效标准,或认定为节能产品。

公司先后通过了ISO9001/ISO、欧盟CE认证、德国TUV CLASS 0无油认证、国家节能认证,2015年,公司获批并建立国家能效实验室,并先后获得节能、智能控制相关专利及软件著作权140多项,被认定为“高新技术企业”、“科技小巨人企业”、“企业技术中心”、“专精特新企业”、“高质量发展明星企业”、“瞪羚企业”等。

DENAIR Energy Saving Technology (Shanghai) PLC. is a listed enterprise (Stock Code: 870640) and is considered as one of the leading manufacturer of air compressor products in Shanghai, China. Our goal is to provide exceptional customer service coupled with quality products and energy saving solutions.

DENAIR's primary businesses focus in following key areas:

- Oil-injected rotary screw compressors (Fixed speed and variable speed, high, normal and low pressure)
- Portable air compressors (Diesel-powered and electric motor powered)
- Oil-free air compressors (dry type, scroll type, and water-lubricated type)
- Centrifugal air compressors
- Gas compressors
- High pressure piston air compressors (Oil-injected and oil-free)
- Air treatment equipment (Air dryers, air filters and air receiver tank)
- Vacuum pump
- Heat pump

德耐尔国内销售服务体系 / Denair domestic sales and service system

截至目前,德耐尔已经形成中国市场完善的直销服务体系,在中国客户服务中心(上海)下设华北、东北、西北、西南、中南、华南、华东、长三角八个大区销售服务中心,由分布在全国重点城市的24家直属分公司,10家办事处直接对全国用户进行销售与服务,以确保用户获得产品与服务更专业、更快捷、成本更低。

Up to now, Denair has formed a complete direct sales service system in the Chinese market. In the China Customer Service Center (Shanghai), there are eight regional sales service centers in North China, Northeast China, Northwest China, Southwest China, Central South China, South China, East China, and the Yangtze River Delta. 24 directly affiliated branches and 10 offices in key cities across the country directly sell and serve users across the country to ensure that users can obtain products and services more professionally, faster, and at lower costs.

德耐尔国外销售服务体系 / Denair international trade service system

德耐尔拥有完善的全球销售服务体系,公司下设专业的国际贸易中心,由英语、俄语、法语、阿拉伯语、西班牙语、德语等八个语言分部进行全球市场的品牌推广与服务,目前全球有130多家专业的代理机构在销售和服务德耐尔产品,为150多个国家的终端客户提供服务。

Denair has a complete global sales and service system. Denair has a professional international trade center with eight language branches such as English, Russian, French, Arabic, Spanish, and German carrying out brand promotion and services in the global market. There are more than 130 professional agencies around the world selling and servicing Denair products, and providing services to end users in more than 150 countries.

压缩机结构组成

EXPLODED VIEW OF COMPRESSOR



德耐尔离心压缩机采用模块化设计，包括主机、冷却系统、油站系统、电机、电控系统等专有模块。具有结构紧凑、运行可靠、节能高效、装配量少、安装方便等优点。能够确保为用户提供连续、稳定、无油的高品质压缩空气，为用户提供全方位工业气体系统解决方案。

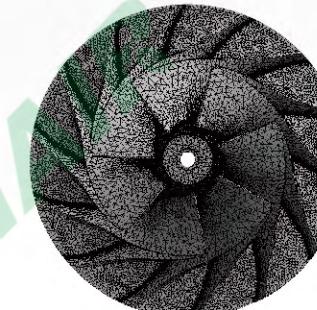
Denair centrifugal compressor adopts modular design, including the air end, cooling system, oil system, motor, electric control system and other proprietary modules. It has the advantages of compact structure, reliable operation, energy saving, high efficiency, less assembly and convenient installation. It can ensure to provide users with continuous, stable, oil-free high-quality compressed air, and provide users with a full range of industrial gas system solutions.

叶轮

Impeller



模型处理
Model processing



网格划分
Grid division



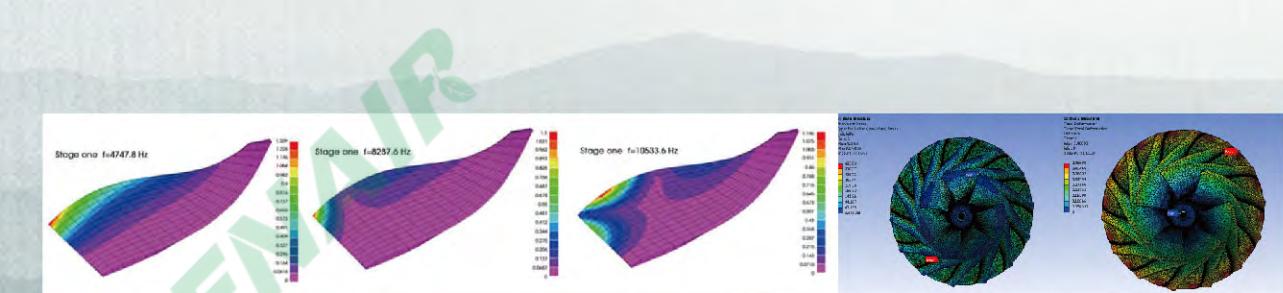
边界条件设置
Boundary condition set

叶轮强度分析

Impeller Strength Analysis

运用有限元分析软件，模拟叶轮在设计工况下的应力和变形量情况。应力分析结果为校核叶轮强度提供了科学的依据，防止机组在实际运行时因叶轮局部应力集中、强度不够酿成事故；计算的轴向、径向变形量为叶轮与进气缸间隙的取值提供了参考，防止机组运行时叶轮与进气缸发生相互刮擦，导致叶轮损毁等重大故障的发生。

The finite element analysis software is used to simulate the stress and deformation of the impeller under the design conditions. The results of stress analysis provide a scientific basis for checking the strength of the impeller, prevent accidents due to local stress concentration and insufficient strength of the impeller during the actual operation of the unit; The calculated axial and radial deformations are the values of the gap between the impeller and the inlet cylinder. It provides a reference to prevent the impeller and the intake cylinder from scraping each other when the unit is running, resulting in impeller damage and other major failures.



转子模态分析
Rotor model analysis

应力计算结果
Stress calculation result

总变形计算结果
Calculation result

气动设计部分

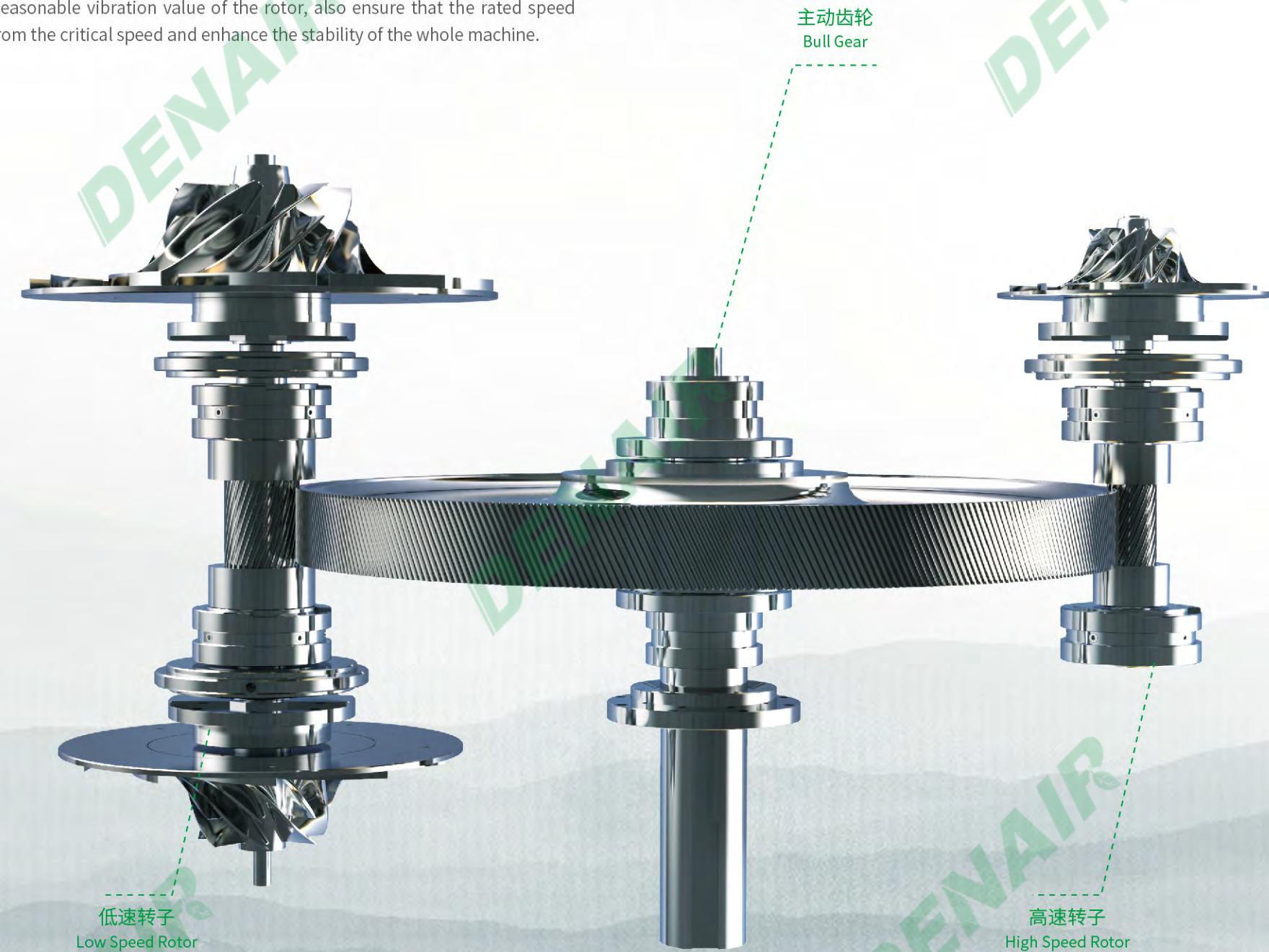
Pneumatic Design Section

德耐尔离心压缩机的气动设计应用先进的空气动力学原理，并结合自主研发的高效建模软件、CFD仿真等手段，确保了更优的级间压缩比分配及稳定可靠性；同时结合德耐尔技术开发团队长期产品验证的设计经验、丰富的叶轮数据库和设计软件，保证了气动设计的优越性。

The aerodynamic design of Denair centrifugal compressors applies advanced aerodynamic principles, combined with self-developed high-efficiency modeling software, CFD simulation and other means, to ensure optimal inter-stage compression ratio distribution and stable reliability; The long-term product verification design experience, rich impeller database and design software of Denair team ensure the superiority of aerodynamic design.

通过专业设计的转子与轴承，确保能在合理的油膜温度、压力、厚度下运行，有效减少轴承功率消耗。提取大量轴承的刚度和阻尼数据，进行转子动力学分析，保证转子合理的振动值，确保额定转速设定远离临界转速运行，增强整机的稳定性。

Professionally designed rotors and bearings ensure that they can operate under reasonable oil film temperature, pressure and thickness, effectively reducing bearing power consumption. Extract the stiffness and damping data of a large number of bearings, conduct rotor dynamics analysis, ensure a reasonable vibration value of the rotor, also ensure that the rated speed setting is far away from the critical speed and enhance the stability of the whole machine.



高可靠性轴承

High Reliability Bearing

精心设计 稳定可靠

Exquisite design Stability and Reliability



通过转子动力学专业设计，采用负载能力强、振动低的可倾瓦轴承。轴承轴瓦可根据负荷与温度变化自动调心，保证机组在应对多种恶劣工况时能够稳定运行。

Through the professional design of rotor dynamics, the tilting pad bearing with high load capacity and low vibration is adopted. The bearing bush can be automatically adjusted according to the load and temperature changes, so as to ensure the stable operation of the unit under various harsh working conditions.



整体铸件齿轮箱-模块化集成装配

Integral casting gearbox-Modular integrated assembly



模块化设计 水平剖分式齿轮箱与各级蜗壳一体铸造，冷却器箱体整体铸造，模块化设计。与焊接齿轮箱分体式结构相比，主机结构强度更高、加工面更少、运行更可靠，各级蜗壳与齿轮箱体无装配误差、无变形、噪音低、振动小。与整体铸造相比，加工、装配、运输、现场安装、维护更加简便。在主机需要返厂大修的情况下，整体铸件需要更大起吊设备且破坏安装基础导致二次安装，而模块化的设计则更好的解决这一问题。

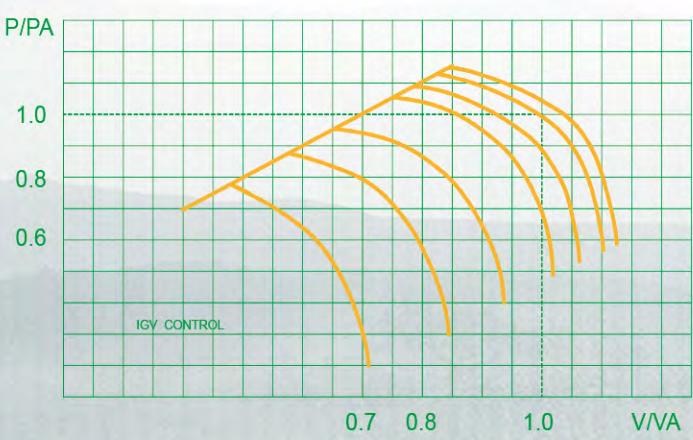
The horizontally split gearbox is integrally cast with the volutes at all stages, and the cooler box is integrally cast with a modular design. Compared with the split structure of the welded gearbox, the main engine mechanism has higher strength, fewer processing surfaces, and more reliable operation. There is no assembly error, no deformation, low noise and low vibration between the volute and the gear box at all stages. Compared with integral casting, processing, assembly, transportation, on-site installation and maintenance are simpler. When the main engine needs to be returned to the factory for overhaul, the integral casting requires larger lifting equipment and destroys the installation foundation, resulting in secondary installation. The modular design it perfectly solves this problem.

高性能IGV

High Performance IGV

IGV 电动执行器驱动翼型不锈钢叶片，对进口导叶开度进行精确控制，改变进气的预旋值，提高离心压缩机运行效率，在压缩空气需求量减少时，IGV可节省最高约9%的能耗，使离心压缩机高效节能运行。

The electric actuator drives the airfoil stainless steel blades, precisely controls the opening of the inlet guide vanes, changes the pre-swirl value of the intake air, and improves the operating efficiency of the centrifugal compressor. When the compressed air demand is reduced, the IGV can save up to about 9%. Energy consumption, making the centrifugal compressor run efficiently and energy-saving.



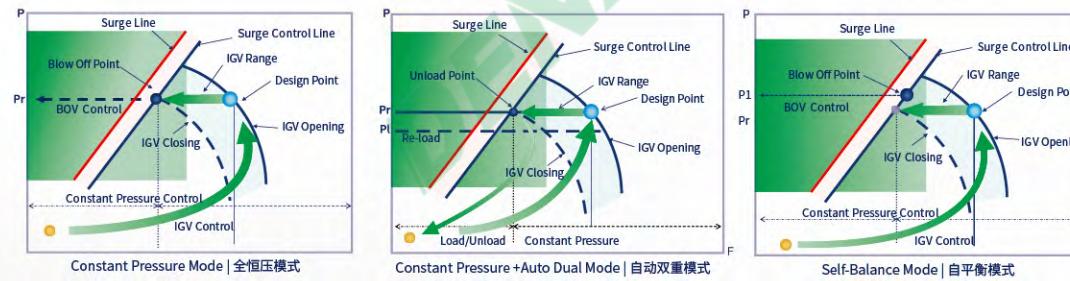
IGV 控制
IGV control

智能化控制系统

Intelligent control system

德耐尔DAC系列离心式压缩机控制系统可以实现全恒压模式、自动双重模式、自平衡模式三种运行模式。能根据客户实际运行工况变化及气量需求进行智能调节，确保设备始终处于高效节能稳定运行状态。

Denair DAC series centrifugal compressor control system can realize three operating modes: full constant pressure mode, automatic dual mode and self-balancing mode. It can intelligently adjust according to the actual operation conditions and gas demand of customers to ensure that the equipment is always in a state of high efficiency, energy saving and stable operation.



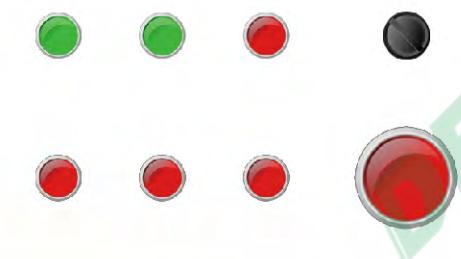
采用IEM云控制平台，可对用户空压系统所有设备运行数据的实时采集，并利用AI，云计算先进技术对数据进行跟踪及分析优化，实现客户站房系统的智能化、可视化。

Using the IEM cloud control platform, it can collect real-time operation data of all equipment in the user's air compressor system, and use AI and advanced cloud computing technologies to track, analyze and optimize the data to realize the intelligence and visualization of the customer station system.



控制柜

Control cabinet



高度集成的机组控制系统，采用西门子PLC及触摸显示屏，控制界面简洁明了，触摸操作简单方便。操作界面支持多种语言切换，显示屏可以实时监控机组内所有参数，将各级关键运行参数实时以运行曲线与数字的方式呈现，自动报警及连锁停机保护，同时具备防喘振和喘振预测功能，确保设备运行的安全和可靠性。

The highly integrated unit control system adopts Siemens PLC and touch display screen, the control interface is concise and clear and the touch operation is simple and convenient. The operation interface supports multi-language switching and the display screen can monitor all parameters in the unit in real time, present key operating parameters at all levels in real time in the form of running curves and numbers, automatic alarm and chain shutdown protection and anti-surge and surge prediction function to ensure the safety and reliability of equipment operation.

产品应用领域

PRODUCT APPLICATION FIELD


 化工行业

- A 压缩空气充当氧化反应气体
- B 压缩空气提供动力
- C 炼化、生产双氧水

 汽车/制造行业

- A 气动、仪表、冲压、电镀、涂装、热处理等生产线
- B 气动扳手、气动打磨机、吹尘枪、等末端工具
- C 保护用气、冷却、除尘、清扫

 航空航天行业

- A 发动机模拟风洞
- B 高空台测试系统
- C 气动部件测试系统

 金属冶炼行业

- A 空分制氮、制氧、制氢
- B 炼铁炼钢、烧结、轧钢等工艺仪表用气
- C 氧化铝、电解铝、铅锌冶炼等仪表用气

 纺织化纤行业

- A 喷气纺织引纬
- B 涡流纺
- C 捻接和仪表用气

 医药行业

- A 生物发酵
- B 化学原材料及制剂

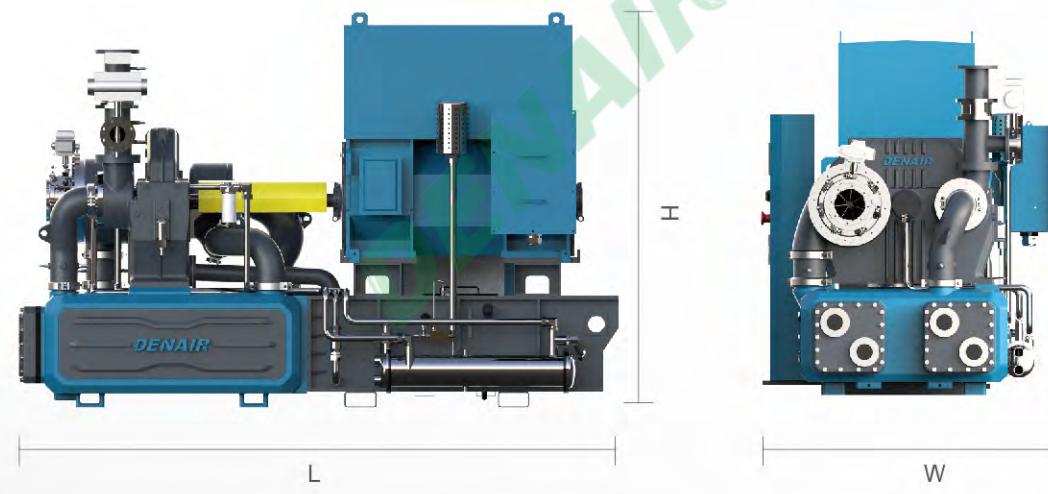
质量控制

QUALITY CONTROL



德耐尔践行“研发设计-精密制造-专业装配-测试验证-运行优化-市场推广-高效服务-持续开发”的产品理念，实现对产品气动设计、结构强度、振动、传动效率、换热及压力损失、整机效率等关键设计结果的全方位测试和验证，从而保证所开发的每一款产品在结构、性能与可靠性、易用性上具备世界同类产品的先进水平。

Denair implements the product concept of "design and development, precision manufacturing, professional assembly, test verification, operation optimization, marketing, efficient service, sustainable development" to realize the product aerodynamic design, structural strength, vibration, transmission efficiency, heat exchange and all-round testing and verification of key design results, such as pressure loss and overall machine efficiency, so as to ensure that each product developed has the advanced level of similar products in the world in terms of structure, performance, reliability and ease of use.



● 可根据客户的需求，为其量身定制流量压力匹配的机型。

According to customers' demand, the models with matching flow and pressure can be customized.

● 大型离心压缩机（空气/氮气）DAC550-DAC3000系列

Large centrifugal compressor (air/nitrogen) DAC550-DAC3000 series

型号 Model	压力 barg	流量范围 m³/min	电机功率		外形尺寸			重量 kg
			kW	HP	L (mm)	W (mm)	H (mm)	
DAC550	0.6-25	430-586	2250-3150	3000-4200	6250	4550	3550	41500
DAC1000	0.6-25	550-1015	2850-5000	3800-5750	8350	3850	3850	45500
DAC1500	0.6-25	920-1650	4500-7850	6000-10500	12500	4550	4550	62500
DAC3000	0.6-25	1680-3000	7980-14500	10800-2000	14500	5350	5350	78500

注：其它压力等级需求具体参数请咨询德耐尔公司
Note: contact Denair for more models.

● 增压机组（空气/氮气）排气压力至16barg-50barg

Turbocharger (air/nitrogen) outlet pressure : 16 barg-50 barg

型号 Model	压力 barg	流量范围 m³/min	排气压力 barg	电机功率 kW	外形尺寸			重量 kg
					L (mm)	W (mm)	H (mm)	
DAC550-HB	0.3-1.0	436-586	16-50	1214-1758	5250	3250	2850	25000
DAC1000-HB	0.3-1.0	550-1020	16-50	1925-3570	5850	3550	3150	32500
DAC1500-HB	0.3-1.0	920-1650	16-50	3220-5775	6500	4350	3550	42500
DAC3000-HB	0.3-1.0	1680-3000	16-50	5880-10500	7500	5350	4250	58500

注：其它压力等级需求具体参数请咨询德耐尔公司
Note: contact Denair for more models.

● 离心压缩机技术参数表

Technical parameters of centrifugal compressor

型号 Model	压力 barg	流量范围 m³/min	电机功率		外形尺寸			重量 kg
			kW	HP	L (mm)	W (mm)	H (mm)	
DAC50	0.6-8	25-48	132-263	175-350	2650	1650	1850	3860
DAC80	0.6-10	40-85	225-450	300-600	3350	1860	2150	6500
DAC120	0.6-13	75-123	400-630	535-850	3850	2100	2250	8250
DAC200	0.6-13	115-208	618-1120	830-1120	4250	2150	2350	11800
DAC250	0.6-20	175-260	925-1375	1250-1850	4500	2250	2380	16000
DAC300	0.6-25	228-310	1225-1600	1650-2200	4650	2250	2450	17500
DAC350	0.6-25	283-360	1500-1850	2000-2500	4850	2250	2500	18500
DAC450	0.6-25	350-460	1800-2350	2400-3150	5250	2300	2950	21500

注：其它压力等级需求具体参数请咨询德耐尔公司
Note: contact Denair for more models.



魄 德耐尔拥有全球性的服务网络以及专业的服务团队，24小时不间断服务响应。完备的备件库存，包括部分电机、铸件、进气缸、叶轮、轴承、气封，油封等关键零部件，以及常规空滤芯、油滤、油雾分离芯、电机润滑脂、润滑油、保养配件等。依托从上海到全球的有序物流体系，确保国内外各分公司、办事处、经销代理商及客户能及时有效得到备件供应，并提供专业全面的售后服务。

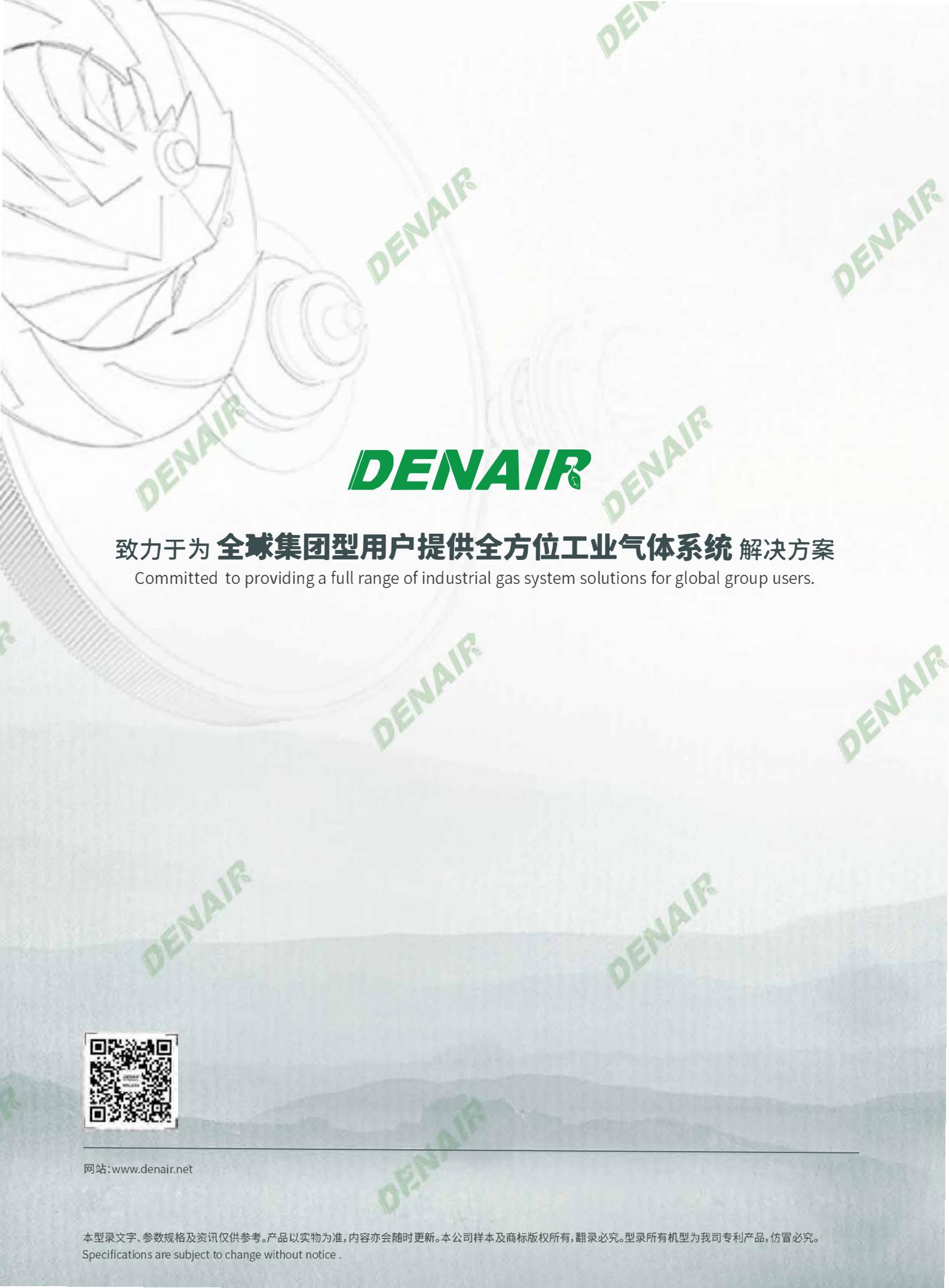
Denair has a global service network and a professional service team with 24-hour continuous response. There are complete spare parts inventory, including some motors, castings, intake cylinders, impellers, bearings, air seals, oil seals and other key components, as well as conventional air filters, oil filters, oil mist separation cores, motor grease, lubricants, maintenance accessories, etc. Relying on the sequential logistics system from Shanghai to the world, we ensure that domestic and foreign branches, offices, distribution agents and customers can obtain spare parts supply in a timely and effective manner, and be provided professional and comprehensive after-sales service.

服务中心 Service Center



中国运营总部/Headquarters in China
德耐尔节能科技（上海）股份有限公司
地址:上海市金山区枫泾镇亭枫公路671号
电话(Tel):(86-21)60405928
传真(Fax):(86-21)37831822





DENAIR

致力于为 **全球集团型用户** 提供 **全方位工业气体系统** 解决方案

Committed to providing a full range of industrial gas system solutions for global group users.



网站: www.denair.net

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