



鑫瑞拓
Xinruituo

磁悬浮高速离心鼓风机 Magnetic levitation high speed centrifugal blower



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山东瑞拓鼓风机有限公司
SHANDONG RUI TUO BLOWER CO.,LTD.

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公司简介

Company introduction

山东瑞拓鼓风机有限公司，是一家集科研、生产、销售、技术服务为一体的企业，现座落于山东省省会“泉城”济南。总公司位于“风机之乡”章丘，占地4万平方米，公司注册资金叁仟万元，现有员工百余名，核心技术人员20名。

公司拥有磁悬浮鼓风机、空气悬浮鼓风机、MVR蒸汽压缩机、RTL、RTGR、RTR二叶系列罗茨风机，RTSR三叶系列罗茨风机RT、RTC、RTLH、RTSL、B系列风机产品，共600多种规格型号。包括：罗茨风机，罗茨鼓风机，氧化风机，脱硫风机，硫化风机，污水处理罗茨风机，真空包装罗茨风机，水泥厂专用风机，水产养殖增氧机，高压风机，负压罗茨风机，气力输送设备，除尘设备，脱硫脱硝设备，污水处理整套设备及配件等，服务于电力、冶金、石油、化工、钢铁、水泥、环保、矿山、隧道、风洞等行业，市场前景广阔。随时欢迎您来厂考察。山东瑞拓鼓风机有限公司各地办事处目前有：山东（青岛）、天津、北京、沈阳、长春、哈尔滨、西安、兰州、银川、包头、太原、石家庄、合肥、无锡、南京、重庆、成都、昆明、杭州、福建、广州、南昌、武汉等20多处办事处。集售前、售中、售后于一体的服务系统，为客户第一时间上门服务，解决问题。

Shandong ruituo blower Co., Ltd. is an enterprise integrating scientific research, production, sales and technical services. It is located in Jinan, the capital of Shandong Province. The head office is located in Zhangqiu, the hometown of wind turbines, covering an area of 40000 square meters, with a registered capital of 30 million yuan. It has more than 100 employees and 20 core technicians.

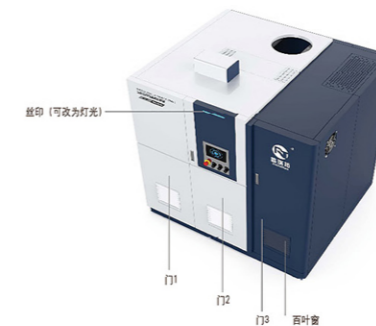
The company has magnetic suspension blower, Air suspension blower, MVR steam compressor, RTL, rtgr, RTR two blade series Roots fan, RTSR three blade series Roots fan RT, RTC, rtlh, RTSL, B series fan products with more than 600 specifications and models. Including: Roots blower, roots blower, oxidation blower, desulfurization blower, sulfuration blower, sewage treatment roots blower, vacuum packaging roots blower, special blower for cement plant, aquaculture aerator, high-pressure blower, Negative pressure roots blower, pneumatic conveying equipment, dust removal equipment, desulfurization and denitrification equipment, sewage treatment equipment and accessories, etc., are used in electric power, metallurgy, petroleum, chemical industry, steel, cement, environmental protection, mining, tunnel, wind tunnel and other industries, with broad market prospects. You are welcome to visit our factory at any time. At present, Shandong ruituo blower Co., Ltd. has more than 20 offices in Shandong (Qingdao), Tianjin, Beijing, Shenyang, Changchun, Harbin, Xi'an, Lanzhou, Yinchuan, Baotou, Taiyuan, Shijiazhuang, Hefei, Wuxi, Nanjing, Chongqing, Chengdu, Kunming, Hangzhou, Fujian, Guangzhou, Nanchang, Wuhan, etc. Set pre-sale, sale, after-sale in one service system, to provide customers with first-time door-to-door services, solve problems.

技术核心介绍

Key technology introduction

磁悬浮高速离心鼓风机是将磁悬浮轴承技术和高速电机技术融入传统风机之中所形成的一种高效节能环保的新型鼓风机，具有结构简单、高效智能、一体化、操作维护简单、运行费用低的显著优点，可广泛应用于污水处理（市政、工业及其他）、物料输送、食品医药、纺织印染、皮革造纸、玻璃制造、钢铁冶金、烟气脱硫等项目中，节能效果显著。

High speed magnetic levitation centrifugal blower is one new type blower using magnetic levitation bearing technology and high speed motor technology on the basic of traditional blower. It is in simple blower structure, high efficiency, intelligent, integration, easily operation and maintenance, low operation cost. It could be widely used in waste water treatment(municipla, industrial and others), pneumatic conveying, food, medicine, textile, printing, leather paper, glass production, steel metallurgy, gas desulfurization, and so on, better performance in energy saving.



工作原理

Working therey

磁悬浮高速离心鼓风机采用了高速永磁同步电机的直驱结构，将离心叶轮和电机驱动一体化集成设计，它通过内置的位移传感器实时检测转子轴的振动及空间间隙，将得到的信号送入磁悬浮轴承控制器进行调理、解析、运算，产生控制电流，再将该电流输入磁轴承绕转线圈，产生电磁力，从而实现转子轴的悬浮。

永磁同步电机的主要功能是驱动转子轴的旋转，它通过变频器产生频率可控的电流，将此电流输入电机定子产生的旋转磁场，带动转子轴高速旋转。

风机的主要功能是实现鼓风，随转子轴一同做高速旋转的叶轮带动空气，对空气做功，空气从蜗壳的进气口集流器进入，空气在蜗壳的导向与增压作用下成为具有一定流速与压力的气体，最后从蜗壳的出气口鼓出，实现一定压力和流量气体的输送。

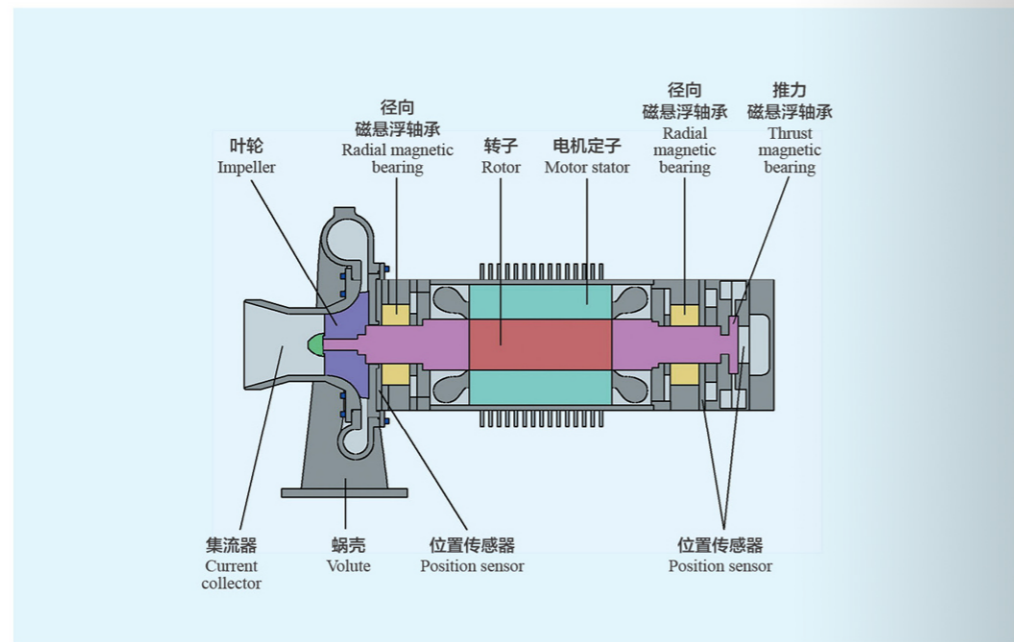
Magnetic levitation centrifugal blower uses the direct driving structure of high rotary speed permanent magnet motor, designed together with centrifugal impeller and motor driving. It monitors the vibration of shaft and space gap by the motion detector inside. Then it would transfer the signal to the magnetic levitation bearing controller to adjust, parsing, calculation, and producing controlling current, to transport the current into the magnetic bearing winding coil, and producing electromagnetic force, then realize the levitation of shaft.

The main function of permanent magnet synchronous motor is to driving the rotary of shaft. It produce the frequency controllable current, and transport the current into the rotary magnetic field of motor stator, to drive the shaft rotary in a higher speed.

The blower's main function is to boosting air. The impeller, which whirling together with shaft, works on air. Air enters from the inlet collector of the volute, and the air becomes a gas with a certain flow rate and pressure under the guidance and pressurization of the volute, and finally blows out from the air outlet of the volute, to realize a gas delivery process with certain pressure and flow rate.

磁悬浮高速离心鼓风机

Magnetic levitation high speed centrifugal blower



性能特点

Performance features

高效益与收益率

- 采用自主设计的高效离心叶轮 + 高效永磁同步电机驱动。
- 与容积式罗茨风机相比效率可提升 30%。
- 与多级离心鼓风机相比效率可提升 20%。
- 与齿轮增速单级离心鼓风机相比效率可提升 15%。

High efficiency and profitability

- Self-designed high-efficiency centrifugal impeller + high-efficiency permanent magnet synchronous motor drive.
- 30% higher efficiency than volumetric roots fans.
- 20% more efficient than multi-stage centrifugal blowers.
- 15% higher efficiency compared to gear-speed single-stage centrifugal blowers.

无润滑油、无机械保养

- 由于采用先进的磁悬浮轴承技术，省却了传统风机所必需的复杂的齿轮变速箱及油性轴承，所以做到了无润滑油、无机械保养，减少了废油等污染物排放降低使用成本，在各种生产工况下提高整个系统稳定性、可靠性。

No needs of lubrication and mechanical maintenance

- Due to the use of advanced magnetic levitation bearing technology, the complicated gearboxes and oily bearings necessary for traditional fans are eliminated, so there is no lubricant, no mechanical maintenance, reduced emissions of waste oil and other pollutants, and reduced operating costs. Improve the stability and reliability of the entire system under production conditions.

低振动、低噪音

- 由于采用先进的磁悬浮轴承系统及一体式隔音罩，转动部件与机械系统无接触，无机械摩擦，运转稳定，振动很小，整机噪音低于 85 分贝。高效、宁静、环保、安装灵活且简便。

Low vibration and noise level

- Due to the use of an advanced magnetic suspension bearing system and an integrated soundproof cover, the rotating parts have no contact with the mechanical system, no mechanical friction, stable operation, low vibration, and the whole machine noise is less than 85 decibels. Efficient, quiet, environmentally friendly, flexible and easy to install.

易安装、易维护

- 磁悬浮高速离心鼓风机重量轻、体积小、外观漂亮、触摸屏控制、操作简单。
- 日常维护仅需要更换空气过滤器，方便简单，节约了设备维护成本。

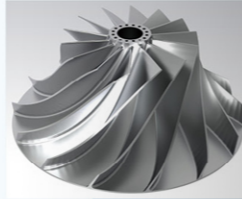
Easy to installation and maintenance

- Magnetic levitation high-speed centrifugal blower is light weight, small size, beautiful appearance, touch screen control, easy operation.
- Routine maintenance only needs to replace the air filter, which is convenient and simple, saving equipment maintenance costs.

核心技术 key technology

高效离心叶轮

- 采用三元流动理论设计及参数优化，使叶轮效率最大化，工作区域广。
- 离心叶轮材质采用高强度锻铝或钛合金，抗变形能力强。
- 经五轴数控加工中心精密加工而成，防腐性能好。
- 我们设计的每一个型号的叶轮都经过长期的台架实验，确保其气动性能高效可靠，叶轮多变效率可达85%，并通过115%超速试验测试，采用变频调节方式，取消了导叶片调节，启动电流更小，鼓风机的可调范围更宽。

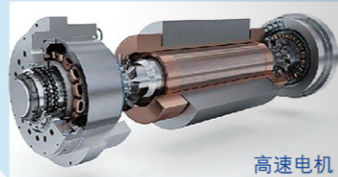


High-efficiency centrifugal impeller

- Adopt ternary flow theory design and parameter optimization to maximize impeller efficiency and wide working area.
- Centrifugal impeller is made of high-strength forged aluminum or titanium alloy, which has strong resistance to deformation.
- Accurately processed by a five-axis CNC machining center, with good corrosion resistance.
- The impeller of each model we designed has undergone long-term bench tests to ensure that its aerodynamic performance is efficient and reliable. The variable efficiency of the impeller can reach 85%, and it has passed 115% overspeed test. It adopts variable frequency adjustment to eliminate the guide blade adjustment, smaller starting current, wider adjustable range of blower.

大功率高速永磁同步电机

- 采用高速大功率永磁同步电机。
- 电机体积小，重量轻，功率密度高。
- 电机转速高，最高可达60000转/分钟。
- 可实现无级调速控制。
- 电机转子和叶轮耦合，减少中间耗能，运行故障率低，传动效率高。



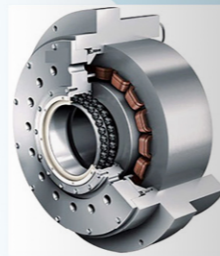
高速电机

High power high speed permanent magnet synchronous motor

- High speed and high power permanent magnet synchronous motor.
- Small motor size, light weight and high power density.
- High motor rotary speed, up to 60,000 rpm.
- Can achieve stepless speed control.
- Motor rotor and impeller are coupled, reducing intermediate energy consumption, low operating failure rate and high transmission efficiency

磁悬浮轴承

- 无磨损 / 无需润滑，可实现高速运转。
- 可监控转子状态，可监控轴承状态。
- 无需润滑，减少外壳尺寸和重量。
- 半永久性寿命，无需维护。
- 采用5自由度主动磁悬浮轴承技术，利用电磁力实现转子悬浮。



Magnetic bearing

- No wear / lubrication for high speed operation.
- Monitor rotor status and bearing status.
- No lubrication required, reducing case size and weight.
- Semi-permanent life without maintenance.
- Adopt 5 DOF active magnetic levitation bearing technology to realize rotor suspension by electromagnetic force.

产品系列及参数

Product series & specifications

HMGB 200 - 200 L / B

产品版本 Product series

叶轮型号 Impeller size

入口流量 Inlet flow rate

电机功率 Motor power

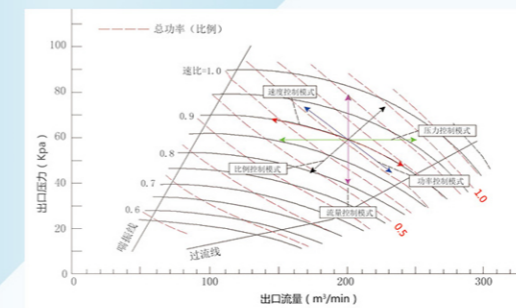
瑞拓磁悬浮鼓风机 Ruituo Magnetic levitation blower

以 HMGB200-200L/B 型号为例 -refer to Model: HMGB200-200L/B

型号 Model	流量 Suction Flow(m ³ /min)	压力 pressure (Kpa)	功率 Motor Power(kW)
HMGB55	28~19	30~50	55
HMGB75	70~30	40~120	75
HMGB90	100~40	40~120	90
HMGB132	120~45	40~120	132
HMGB150	150~57	40~120	150
HMGB200	220~84	40~120	200
HMGB300	270~138	50~120	300
HMGB350	310~105	50~120	350
HMGB400	350~130	50~120	400

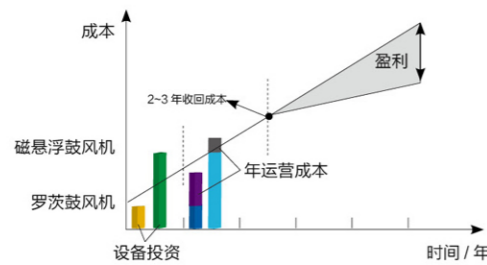
鼓风机运行模式

Blower operation mode



磁悬浮高速离心鼓风机与罗茨鼓风机的比较

The compare of magnetive levitation high speed centrifugal blower and roots blower



比较项 Compare item	磁悬浮离心鼓风机 Magnetive levitation centrifugal blower	罗茨鼓风机 Roots blower
风机输入功率 Blower input power	75KW	150KW
整机效率 Whole set efficiency	85%	55%
每日运行时间 Daily operation time	24h	24h
每年功率耗费 Power cost per year	648000kw/h	1296000kw/h

单台磁悬浮鼓风机预计每年可节约 30 万度电

磁悬浮高速离心鼓风机与齿轮增速离心鼓风机的技术性能比较

Technical performance compare of magnetive levitation centrifugal blower and Gear increasing centrifugal blower

比较项 Comparison item	磁悬浮高速离心鼓风机 Magnetive levitation high-speed centrifugal blower	齿轮增速离心鼓风机 Gear increasing centrifugal blower
轴承类型 Bearing type	磁悬浮轴承 Magnetic bearing	润滑油轴承 Lubricant bearings
齿轮增速器 Gear booster	无 no	有 Have
润滑油循环系统 Lube oil circulation system	无需 No need	需要, 维护成本高, 产生危害物排放 Required, high maintenance costs, and hazardous emissions
轴承寿命 Bearing life	永久性 Permanent	十年 Ten years
机械损失 Mechanical loss	小于 1% 1% less than 1%	动力输送, 10%-12% 与总功率成正比 Power transmission, 10%-12% is proportional to total power
电机 Motor	永磁同步电机 (15000-40000rpm) Permanent magnet synchronous motor	交流感应电机 (3000-4000rpm) AC induction motor
变频技术 Frequency conversion technology	采用 use	无 no
启动电流 Starting current	软启动, 无冲击电流 Soft start, no inrush current	启动负荷高, 启动电流为满负荷工作电流的 6-10 倍 Start up high, starting current is 6-10 times of full load working current
系统总绝对效率 Total system absolute efficiency	67%-75%	58%-69%
风量控制 Air volume control	由变频器控制电机转速 Motor speed controlled by inverter	机械方式带动调节进出口导叶开度 Mechanically driven adjustment of guide vane opening
噪声 Noise	80-85 分贝	85-120 分贝
维护 Maintain	定期更换空气过滤器 Change the air filter regularly	每三年检查维护轴承、润滑油循环系统及冷却系统等 Inspection and maintenance of bearings, lubricant circulation systems and cooling systems every three years

产品系列及参数

Product series & specifications

鼓风机安装于一个相对干净和干燥的室内区域, 并留有足够的空间来确保空气流通。请勿将鼓风机安装于室外或暴露在雨、雪和潮湿的环境中。若不具备上述条件, 请在安装前咨询我公司。

The blower is installed in a relatively clean and dry indoor area with sufficient space to ensure air circulation. Do not install the blower outdoors or exposed to rain, snow, and humidity. If the above conditions are not available, please consult our company before installation.

A 磁悬浮离心式鼓风机的推荐运行环境温度为 $-10^{\circ}\text{C} \sim 45^{\circ}\text{C}$ 。如果环境温度始终低于 0°C , 请在鼓风机房增加供暖设备; 如果环境温度始终高于 35°C , 请务必加强鼓风机房的通风, 保证室内热量的散发。

The recommended operating ambient temperature of the magnetic levitation centrifugal blower is $-10^{\circ}\text{C} \sim 45^{\circ}\text{C}$. If the ambient temperature is always lower than 0°C , please add heating equipment in the blower room; if the ambient temperature is always higher than 35°C , be sure to strengthen the ventilation of the blower room to ensure the indoor heat dissipation;

B 受制于电子元器件及流体部件性能, 推荐将鼓风机安装于海拔小于 1000 米的地区。如果不得不安装于海拔大于 1000 米的区域, 请在安装前咨询我公司工程师。

Subject to the performance of electronic components and fluid components, it is recommended to install the blower at an altitude of less than 1000 meters. If you have to install in an area with an altitude of more than 1000 meters, please consult our engineers before installation;

C 为保证鼓风机可靠工作及安装、维护与保养的方便性, 鼓风机四周应有一定的空间, 推荐最小的预留空间范围见图, 建议在此基础上适当的增加鼓风机房的面积, 可降低房间回声。

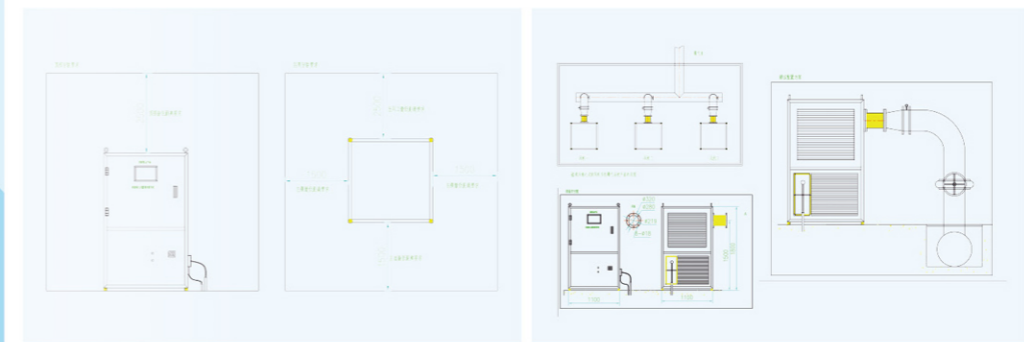
In order to ensure the reliable operation of the blower and the convenience of installation and maintenance, there should be a certain amount of space around the blower. The recommended minimum reserved space is shown in the figure. It is recommended that the area of the blower room be appropriately increased to reduce Room echo.

D 鼓风机应尽量安装在洁净的场所, 灰尘多会缩短入口过滤器的使用寿命, 导致电机发热严重或过滤器频繁更换。

The blower should be installed in a place as clean as possible. The dust will shorten the service life of the inlet filter, which will cause the motor to generate severe heat or the filter to be replaced frequently

E 鼓风机应安装在湿度低的场所, 湿度大将会增加电子元器件发生故障的概率。

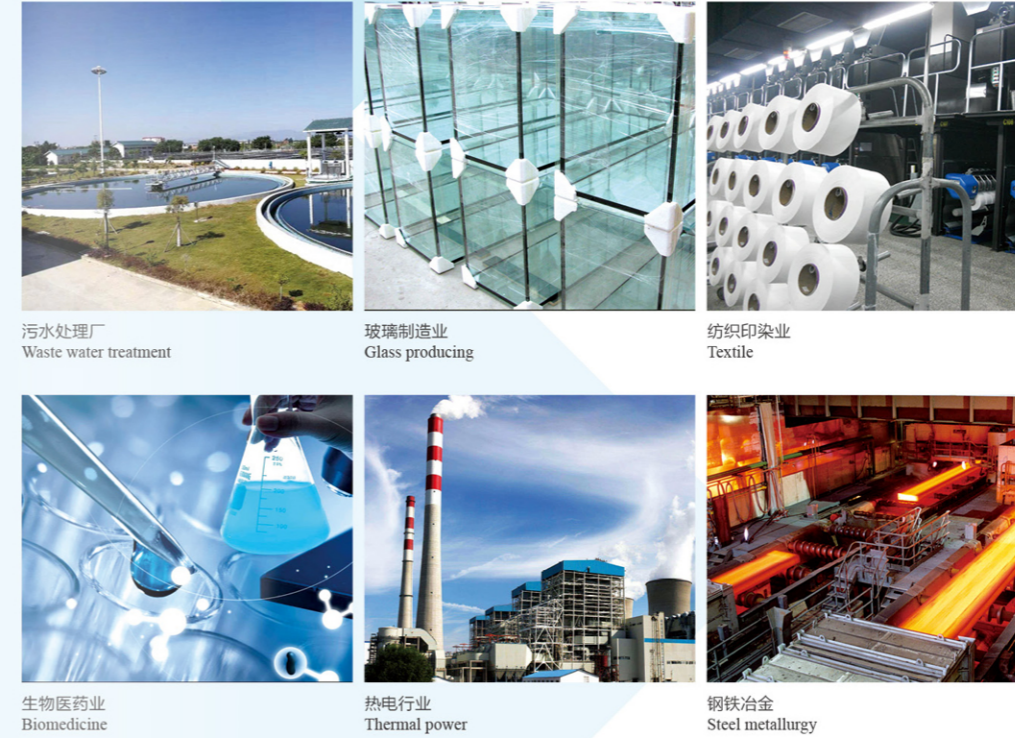
The blower should be installed in a place with low humidity. High humidity will increase the probability of failure of electronic components;



加工检测设备 Processing and testing equipment



应用领域 Application area



污水处理厂
Waste water treatment

玻璃制造业
Glass producing

纺织印染业
Textile

生物医药业
Biomedicine

热电行业
Thermal power

钢铁冶金
Steel metallurgy

污水、石油、冶金、制药、煤炭、化工、纺织、印染、食品、水泥、电力行业。

Waste water treatment, oil, metallurgy, medicine, coal, chemical, textile, printing, food, cement, electric power.

广泛用于各个行业的曝气，增压，气体输送，烘干、萃取、净化、真空包装、溶液回收、气相分离等工艺。

Widely used in different industries, for aeration, pressure rising, pneumatic conveying, drying, Extraction and purification, vacuum pressure package, Solution recovery, gas phase separation and other processes.