

NASH 绿色智能化解决方案 – 电力行业
NASH Green & Intelligent Solutions for Power Industry



Nash-在真空和气体输送领域为您提供绿色智能化解决方案
Nash, a Green & Intelligent Solutions Provider
in Vacuum Pumping & Gas Transportation

作为英格索兰旗下工业技术与服务集团压力与真空解决方案事业部的核心成员，倍缔纳士依托英格索兰全球资源，已成为亚太地区的生产基地与研发中心之一。深耕中国30年来，聚焦工业、能源、环境、医疗、通用等多元行业，提供从核心设备到系统集成的全链条解决方案。旗下汇聚 NASH、Garco、Hoffman、Lamson、Runtech 等众多泵、压缩机及风机核心品牌，以百年技术传承与创新研发，满足不同场景的多样化需求。

倍缔纳士整合跨品牌优势资源，打造一站式工程化服务体系，为客户提供液环真空泵/压缩机、多级/单级/磁浮/罗茨风机、螺杆真空泵、爪泵等全系产品及定制化解决方案。依托本地化生产基地，实现快速响应与高效服务：百年品牌的罗茨增压泵-KINNEY在2021年被IR收购，自2023年起产品线逐渐转移至NASH博山工厂进行生产；为支持亚太业务快速增长，提供更快捷、完善的服务，Runtech透平真空泵于2024年初开始国产化。

As a core member of the Pressure & Vacuum Solutions Division under Ingersoll Rand's Industrial Technologies and Services, Nash leverages Ingersoll Rand's global resources to stand as one of the leading production bases and R&D centers in the Asia-Pacific region. With 30 years of dedicated presence in China, it focuses on diverse industries including industrial, energy, environmental, medical, and general sectors, offering full-chain solutions ranging from core equipment to system integration. Its portfolio encompasses renowned core brands in pumps, compressors, and blowers such as NASH, Garco, Hoffman, Lamson, and Runtech, backed by a century of technical heritage and innovative R&D to meet the diverse needs of different scenarios.

Nash integrates cross-brand advantageous resources to build a one-stop engineering service system, providing customers with a full range of products including liquid ring vacuum pumps/compressors, multi-stage/single-stage/magnetic levitation/roots blowers, screw vacuum pumps, claw pumps, as well as customized solutions. Relying on localized production bases, it achieves rapid response and efficient services: KINNEY, was acquired by IR in 2021, and its product lines have gradually been transferred to NASH's Boshan factory for production since 2023; to support the rapid growth of Asia-Pacific business and provide faster and more comprehensive services, Runtech's turbomolecular vacuum pumps began localization in early 2024.

智能化的真空泵和风机整体解决方案，为您提供更多的柔性设计和节能的空间
Intelligent vacuum pump and blowers solutions, providing you with more flexible designs and energy-savings

倍缔纳士致力于为客户提供高效节能的整体解决方案。从产品到系统，从技术到服务，从Nash液环真空泵到Hoffman & Lamson各类鼓风机，从单泵到智能化机组，我们的方案始终将用户的需求放在首位。多年来，倍缔纳士已凭借优质的产品、先进的技术、优秀的团队，丰富的经验、创新的理念及全球化的服务体系，逐渐成为全球电力行业客户的首选供应商。

Hoffman®和Lamson®是世界领先的离心鼓风机品牌。随着全球工业的发展和对节能环保的重视，越来越多的用户认识到离心风机的价值所在。离心风机在电力行业得到了越来越广泛的应用。

作为全球领先的离心鼓风机制造商，Hoffman&Lamson在全球的运行业绩已超过20万台。倍缔纳士机械有限公司是集团在全球的两大离心风机的生产基地之一，目前有最全面的产品线，包含多级离心风机、磁悬浮风机后面增加空气悬浮风机以及集团旗下的罗茨风机和螺杆风机产品。最高1.7bar的压头范围。不断创新的技术以及丰富的本地化的运行经验，能够为用户提供最可靠、最高效、最经济的离心风机解决方案。

倍缔纳士提供的风机和智能化机组，以其高效节能，运行稳定，噪音低，维护量少，无油污染的气体及本地化服务等优势，逐渐得到了越来越多用户的信任。

Gardner Denver Nash is committed to providing customers with high efficiency and energy savingsthrough our total solutions. From products to systems, kinds of blowers to service, from the liquid ring vacuum Intelligent system centrifugal blowers, from a single pump unit to apackage, our solutions always put the user's benefits first. Over the years, Gardner Denver Nash has been associated with high quality products, advanced technology, excellent teamwork, innovative concepts, rich experience and a worldwide service system; making Nash a preferred supplier of the global electric power industry.

Hoffman® and Lamson® brands belong to the world's leading manufacturer of centrifugal blowers.With the development of global industry and an emphasis on energy conservation and environmental protection, more and more users realize the value of the centrifugal blower. centrifugal blowers have been used in the electric power industry more and more often.

As the largest manufacture of centrifugal blowers, Hoffman&Lamson has more than 200,000 units in operation around the world. GDNC is one of Nash's global manufacturing centers for centrifugal blowers, GDNC provides the most valuable products Including multistage blower, single stage blower、and magnetic centrifugal blowers,and roots and screw blowers of IR group.and the most thoughtful service, the most comprehensive product line, innovative technology and rich experience in the localization of the operation, provide users with the most reliable, efficient and economical centrifugal blower solutions.

GDNC provides centrifugal blower and systems, providing high efficiency and energy savings, stable operation, lower noise levels, less maintenance, oil free and local service.

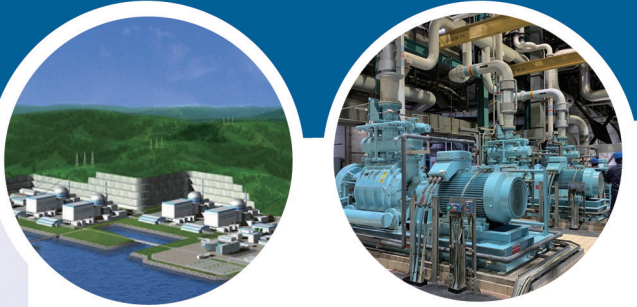
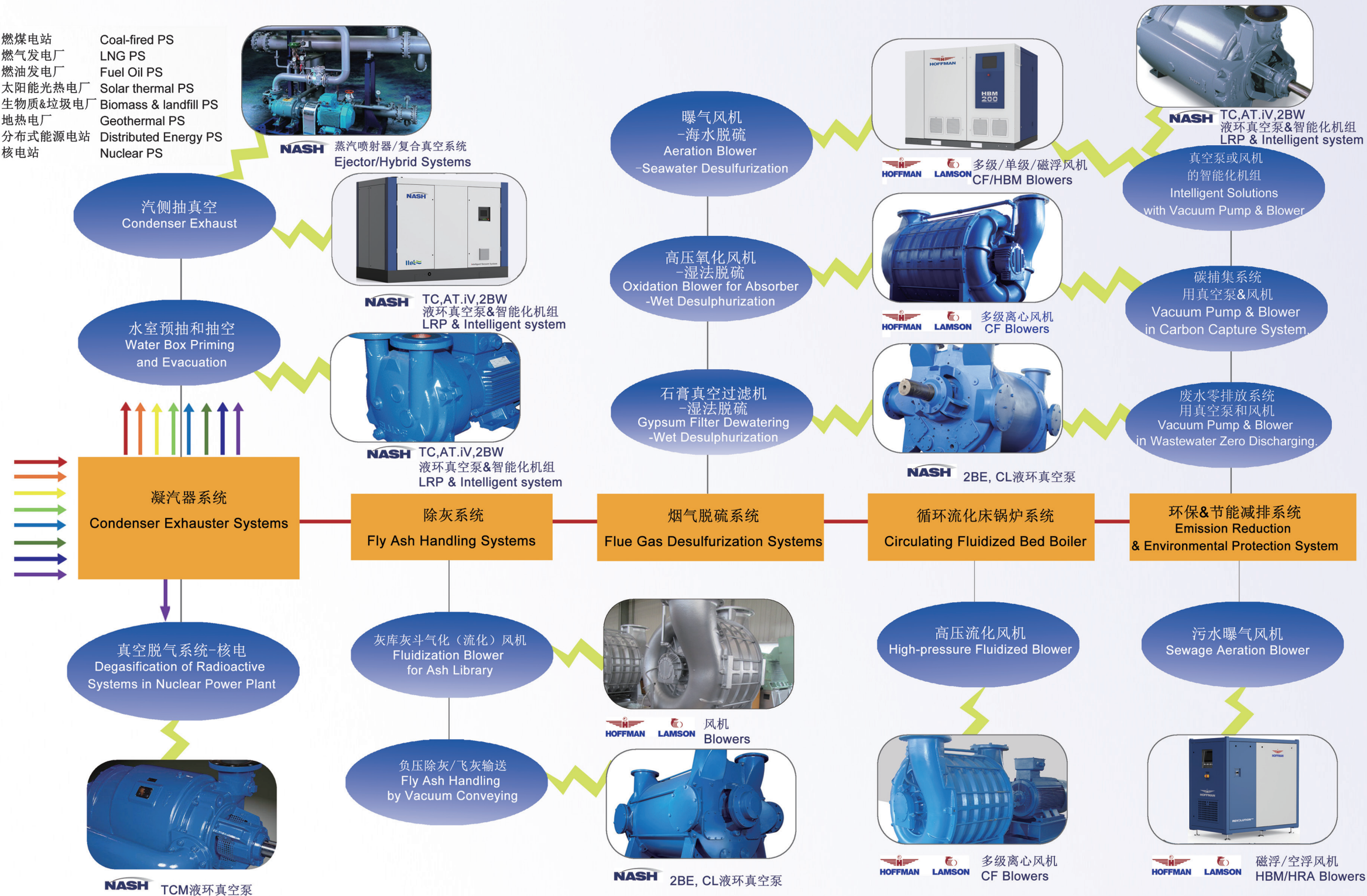
百年品牌，值得信赖
More than 100 years brands, Experience proven results



NASH 绿色智能化解决方案- 能源行业

NASH Green & Intelligent Solutions in Energy Industry

- 燃煤电站 Coal-fired PS
- 燃气发电厂 LNG PS
- 燃油发电厂 Fuel Oil PS
- 太阳能光热电厂 Solar thermal PS
- 生物质&垃圾电厂 Biomass & landfill PS
- 地热电厂 Geothermal PS
- 分布式能源电站 Distributed Energy PS
- 核电站 Nuclear PS



更多的运行经验

More Operating Experience

倍缔纳士从1940's开始为电站提供产品和系统，在中国的电力行业也有近30年运行经验。国电集团山东石横电厂一期工程2 × 300MW机组使用的真空泵设备1985年供货，1987年投运；中国第一台核电站大亚湾核电站1994年投运，至今还在安全稳定的运行。

到今天，在中国的核电站的业绩超过160台，占中国核电市场的90%以上。倍缔纳士机械有限公司已为全球的电厂提供了上万台的设备，仅中国的电厂就有近4000台的安装业绩。倍缔纳士中国公司也成为倍缔集团全球电力设备主要的生产基地。

Since the 1940's, Nash has provided products and systems for power plants. The company has nearly 30 years of operating experience in China. The vacuum pump for China Guodian corporation's Shandong Shiheng power plant (first phase 2 × 300 MW unit) was supplied in 1985 and was put into operation in 1987; the Dayawan nuclear power station, the first nuclear power plant of China, was put into operation in 1994. Both of these systems are still operating safely and reliably.

To date, we have sold and delivered more than 160 sets of condenser exhauster systems for nuclear power plants and we have earned more than 90% of the market share in China's nuclear power industry. Gardner Denver Nash Machinery Co., Ltd. has provided tens of thousands of systems for global power plants. Nearly 4,000 of these sets are installed in China. We have become the main production base of Nash in the global power market.

凝汽器汽侧抽真空
Condenser Exhausters Systems

汽侧抽空设备用于凝汽器启动阶段的真空预抽和凝汽器运行阶段的真空维持。

The condenser exhauster system is necessary for hogging and holding conditions.

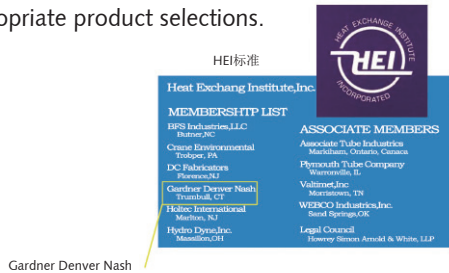
Hogging: Evacuating the condenser for start up

Holding: Removing all non-condensables (air) which would otherwise leak into the condenser during operation

更专业的选型
More Professional Selection

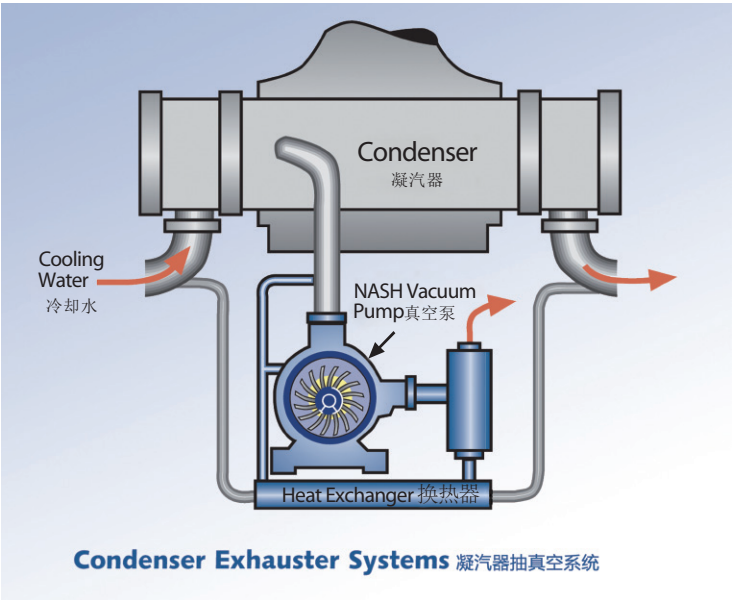
凝汽器系统空气的泄漏量一般按照HEI标准估选，倍缔纳士是HEI标准协会的会员，能够为客户提供更专业的选型方案。

Condenser exhauster systems by Nash are manufactured to HEI standards. Gardner Denver Nash is a member of HEI and we are able to provide our customers with the most professional and appropriate product selections.



不同机组的凝汽器有不同的性能，对抽空设备的要求差异较大。一台600MW的机组，凝汽器背压变化1%，影响每度电消耗的燃煤量约为1.97g左右，影响煤耗量每年超过四千万吨，对每年二氧化碳排放量的影响超过一万吨（按照节约1kg煤减排2.49kg二氧化碳计算）。而这个价值要远远超出抽空设备本身的价值。

Different Nash products will offer different performance savings with the condenser, but all will offer savings. With a 600 MW unit, for example, the condenser pressure will improve by around 1%. The amount of coal that will be saved each kilowatt-hour will be about 1.97 g and this will eliminate the use of more than four thousand tons of coal annually. The impact on the emissions of carbon dioxide each year will be more than ten thousand tons (according to save 1 kg of carbon dioxide emissions 2.49 kg of coal). These savings are far more than the cost of the device itself.



更多Nash解决方案，供您选择
More Solutions With Nash

倍缔纳士的解决方案包括了锥体式双级真空泵、锥体式单级液环真空泵、平圆盘式液环真空泵、蒸汽喷射器和各种智能化机组，广泛的产品线能够保证我们始终站在客观的立场上，为用户选择高效节能的解决方案，以维持最优的凝汽器运行背压。

The total solutions of Gardner Denver Nash include the cone-type two-stage and single-stage liquid ring vacuum pumps, the flat-sided liquid ring vacuum pump, steam ejectors, and various systems. A wide range of products ensures that we always select the most efficient and energy saving solutions for your condenser back pressure operation.

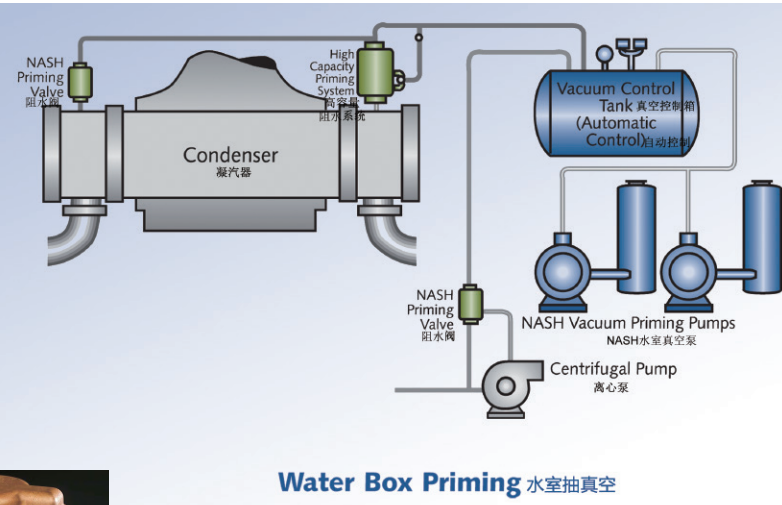


凝汽器水室预抽和抽空
Water Box Priming and Evacuation

水室真空泵的作用有哪些呢？
What is the function of the water box vacuum pump?

- ✓ 在启动前给循环泵注水；
- To evacuate the air in the circulating system in order to pull water up into the pump casing for a quick startup
- ✓ 将循环水抽到凝汽器水室并帮助循环系统建立虹吸；
- To evacuate the air in the circulating system in order to pull water up into the condenser and help to establish vacuum
- ✓ 及时抽走水室中的不凝气体，以保持循环水的水位，提高凝汽器的换热效率。
- To continuously remove air from the water box. Air accumulation in the water box occurs because of the negative pressure of the water piping and the air released from circulating water.

不同的作用，水室真空泵的配置也完全不同。倍缔纳士在水室抽空的应用中有丰富的经验。
Corresponding to different functions, the vacuum pump configuration is completely different.



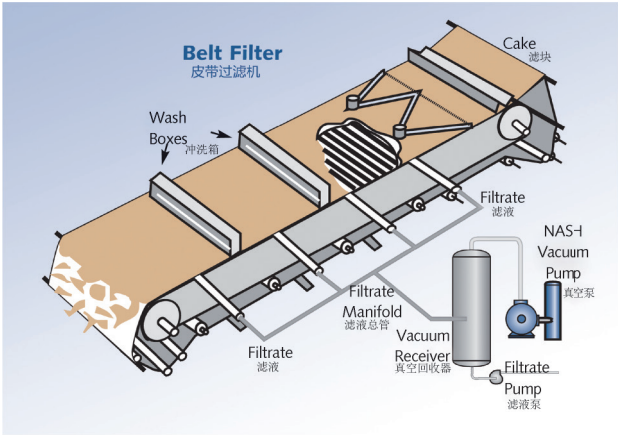
Nash阻水阀
Priming Valve

湿法脱硫系统
Wet Flue Gas Desulfurization Systems

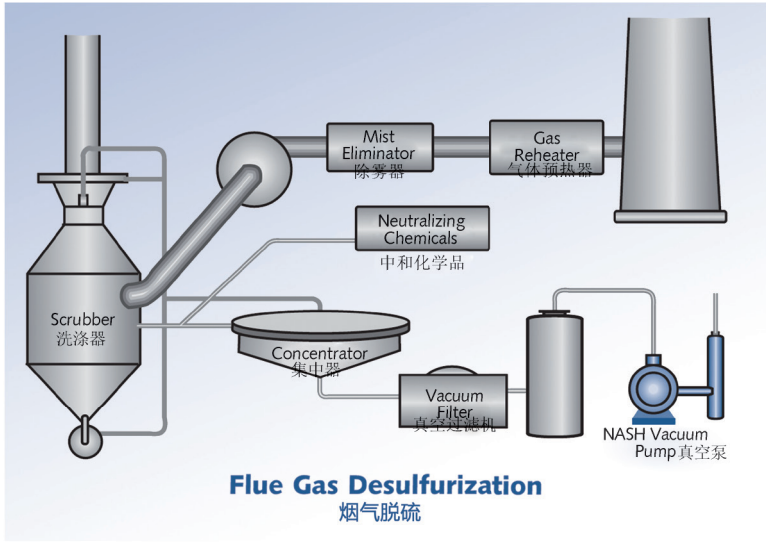
在皮带式过滤机真空泵和负压除灰中的应用，2BE4和2BE5系列是2BE3系列的升级产品，效率提高了5%~10%左右，真空范围最高可到100mbar，轴承的维护也更加简便。

For the applications listed above, we offer the 2BE4 and 2BE5, which are upgrades of the 2BE3 series. The 2BE4 and 2BE5 increase efficiency by approximately 5% - 10%, their vacuum range is up to 100 mbar and bearing maintenance is easier.

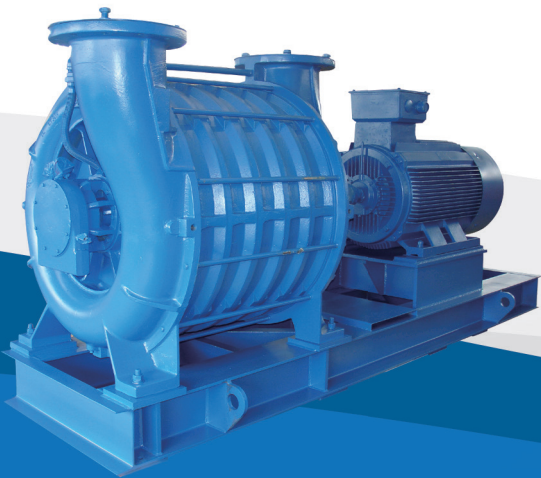
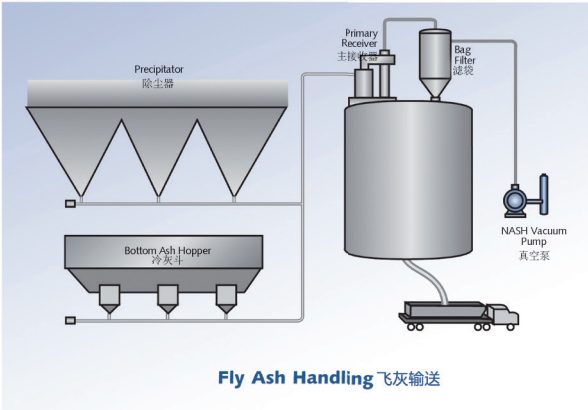
液环真空泵在石膏真空过滤机上的应用
Gypsum (Ca SO4) Filter Vacuum Pump



Runtech
Systems
An Ingersoll Rand Business



液环真空泵在负压除灰系统中的应用
Fly Ash Handling by Vacuum Conveying



MSC-I自适应振控制器
适用于Hoffman & Lamson多级离心鼓风机

湿法脱硫系统
Wet Flue Gas Desulfurization Systems

高压氧化风机
Forced Oxidation Blower

在湿法脱硫工艺中，氧化风机将增压的氧化空气送入吸收塔，氧化空气强制将吸收塔浆液池中的亚硫酸钙氧化为硫酸钙。

氧化风机是湿法脱硫系统中的高能耗设备并且常年运行，老设备的故障率高，能耗高给用户带来了诸多的困扰，也影响了系统的脱硫效率。倍缔纳士的多级离心风机能够帮您解决这一切。

倍缔集团旗下的Hoffman & Lamson品牌从1990年代初开始就为电厂提供产品和服务。凭借其较低的投资成本和很少的日常维护量，为用户带来了可观的效益。

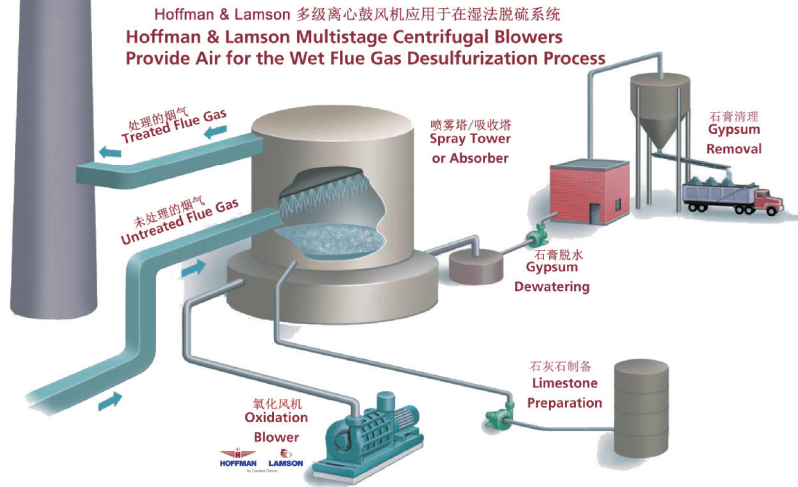
脱硫氧化风机
Desulfurization and Oxidation Blower

HRA空气悬浮鼓风机
Air Suspension Blower

- 产品范围 Scope: 15-300kW
- 压力 Pressure: 40-120kPa
- 气量 Suction Capacity: 11-332m³/min

HBM磁悬浮鼓风机
Maglev Blower

- 产品范围 Scope: 50-1000kW
- 压力 Pressure: 40-160kPa
- 气量 Suction Capacity: 14-750m³/min

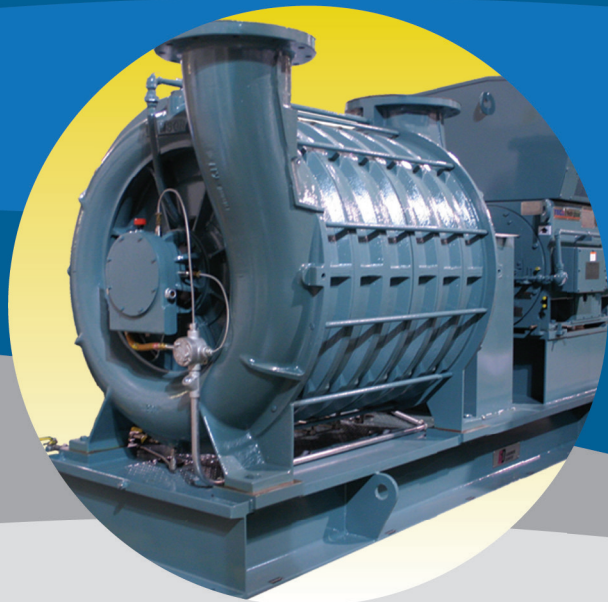


In the wet desulphurization process, forced oxidation blowers force supercharged oxidation air into the absorption tower. This air oxidizes the calcium sulfite and forms calcium sulfate.

Oxidation blowers are the highest energy consuming equipment in the desulfurization system and they run all year round. Old equipment has a high failure rate and high energy consumption by users have created many problems which also affect the desulfurization efficiency of the system. Gardner Denver Nash can help you to solve these problems with our multistage centrifugal blowers.

Our Hoffman and Lamson brands have been providing reliable products to the power industry since the early 1990's. With a much lower initial cost than alternative technologies, our multistage centrifugal blowers also save money by requiring less maintenance.

海水脱硫系统中的曝气风机
Aeration Blower In Seawater Desulfurization Systems

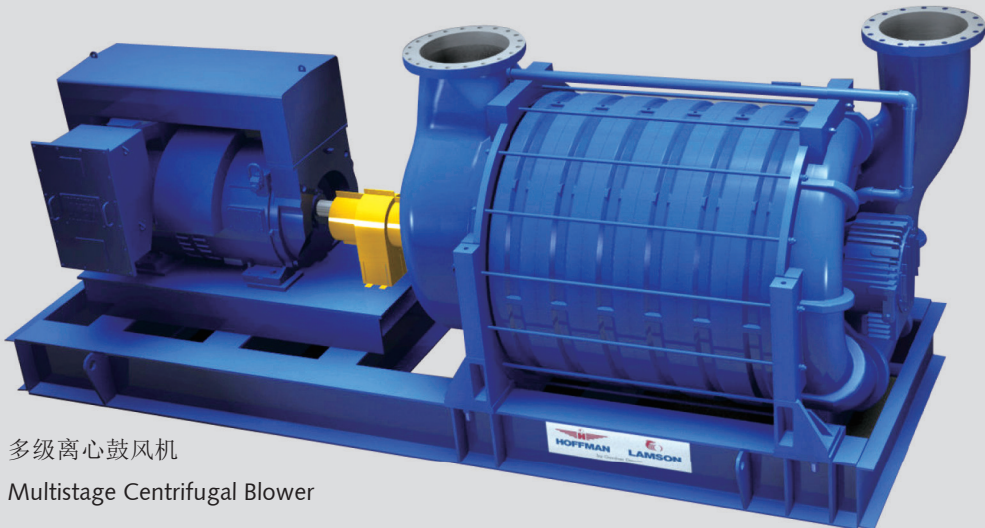


海水脱硫工艺是利用海水的碱度达到脱除烟气中二氧化硫的一种脱硫方法。吸收二氧化硫后的海水与大量未脱硫的海水混合后，经曝气池曝气处理。多级离心风机为曝气池输送大量的氧气。

海水脱硫的工艺系统对曝气风机的要求风量较大而压头较低，其工艺范围刚好是我司大流量多级离心风机产品系列的优势范围。相信我们的风机能为进一步改善您的整个海水脱硫系统做出贡献。

Seawater desulfurization technology uses the alkalinity of the water to a removal the sulfur dioxide in the flue gas. The sulfur dioxide absorption occurs after water mixes with a lot of desulfurization seawater in the aeration tank. Multistage centrifugal blowersconvey a large amount of oxygen for the aeration.

In seawater desulfurization, the process requires an aeration blower with a large air volume and a low pressure head. The process range we offer is just one advantage of our large volume multistage centrifugal blowers. We believe that our blowers can further improve your entire seawater desulfurization system.



多级离心鼓风机
Multistage Centrifugal Blower

循环流化床锅炉
Circulating Fluidized Bed Boiler

高压流化风机
High-pressure fluidized blowers

高压流化风机在CFB锅炉机组中具有重要的作用。它主要用来把煤粉颗粒吹回炉膛，为物料的循环流动提供必要的介质。

选择合适的高压流化风机型式，对循环流化床锅炉的安全稳定运行非常重要。倍締纳士多级离心风机以其高稳定性和低维护的优点成为原设备的最理想替代产品。

High-pressure fluidized blowers play an important role in the CFB boiler unit. They are mainly used to blow the pulverized coal in the furnace back into the chamber of a stove. They provide the necessary circulating medium for the material.

Selecting the appropriate high-pressure fluidized blower type is very important for the safe and stable operation of the circulating fluidized bed boiler. Our multistage centrifugal blowers, with high stability and low maintenance, are the ideal products for upgrading your original equipment.

灰库灰斗气化（流化）风机中的应用
Fluidization blower in Ash library ash hopper

在除灰系统中, 多级离心风机作为供气装置，将锅炉排烟中的飞灰(APH,ECO,ESP)输送到灰库及灰斗中。

In ash handling removal systems, multistage centrifugal blowers provide the fluidization air supply. They deliver the smoke's fly ash (APH, ECO, ESP) from the coal-fired power plant boiler into the ash library and ash hopper.



单级高速离心鼓风机
Single Stage Centrifugal Blower



神华白马电厂
Shenhua Baima PS

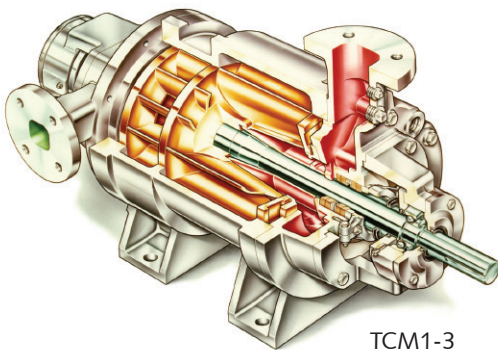


莱州电厂
Laizhou Power Plant

核电中真空脱气系统
Degasification Of Radioactive Systems In Nuclear Power Stations

在核压水反应堆核电站的系统中，液环真空泵用于放射性气体的脱气系统。液环真空泵用以维持蒸汽冷凝器的真空，以降低溶解氢的浓度。

These liquid ring vacuum pumps will be operated in nuclear plants. They are used for the degasification of radioactive systems. A liquid ring vacuum pump maintains a vacuum on the vapor condenser, which reduces the concentration of dissolved hydrogen.



TCM1-3



污水曝气风机
Wastewater Aeration Blowers

信缔纳士Hoffman®和Lamson®品牌多级离心风机，Hoffman & Lamson多级离心风机，单级高速鼓风机，磁悬浮风机，是污水处理应用中公认噪音低，效率高，维护量少的设备。在曝气工艺中，通过对入口阀门调节，我们风机的风量可完美实现对废水中溶解氧浓度的控制。



磁悬浮离心鼓风机
Magnetic Centrifugal Blower

更多革新技术
More Innovative Design

ECO-FLO的专利设计，为客户节约了50%的用水量，适用于CL，2BE4和2BE5系列。

LOBE PURGE技术应用在我们提供的液环真空泵上。通过泵体上的LOBE-PURGE接口，在离心力的作用下，固体介质将自动被排出泵体外。这大大减缓了真空泵的磨损，延长了真空泵的使用寿命。



The innovative design of the ECO-FLO is designed for the CL, 2BE4 and 2BE5 series of pumps. By using it, your water usage can be reduced by 50%.

LOBE PURGE technology is used on every liquid ring vacuum pump we offer. Through the lobe-purge interface on the pump body, solid medium will automatically be discharge from the pump through centrifugal force. This greatly reduces vacuum pump wear and prolongs the life of the vacuum pump.

Lamson & Hoffman multistage centrifugal blowers are the proven standard for water and wastewater treatment applications requiring continuous low-noise operation with high efficiency and minimal maintenance requirements. Primarily used for aeration and aerobic digestion, our blowers can be throttled via an inlet butterfly valve making them an excellent choice for controlling dissolved oxygen concentrations (DO) in the wastewater. Alternatively, by lowering only the unit speed with a VFD, and not throttling, the blower output decreases while the optimal efficiency remains the same as it was at full speed. Our Rigel control and VFD offers this option for all multistage blowers.



电厂的节能技改项目 Power Plant Energy Saving Upgrading Projects

倍缔纳士凭借优秀的团队，丰富的经验，宽广的产品线，国际技术平台，本地化的服务和创新的理念，能够为电厂提供量身定制的节能技改方案。近些年来，通过参与近三百个电厂的节能技改，倍缔纳士节能解决方案已逐渐成为电厂的首选。

Nash China offers an excellent team, rich experience, a wide product line, an international technology platform, local service and innovative concepts. We provide tailor-made energy saving solutions for power plants. In recent years, by participating in three hundreds of power plant energy saving projects, the energy saving solutions of Nash China have become the first choice of power plants.

技改案例 Reference Upgrading Projects	机组容量 Unit Capacity (MW)	真空泵机组 数量 (套) Vacuum Pump Qty.	凝汽器背压 降低约 (kPa) Back Pressure Lower	真空泵运行电流降低 约(A) Current Lower
华电青岛电厂 Huadian Qingdao PS	300*4	8	~0.5	64*4
山东华电章丘电厂 Shandong Huadian Zhangqiu PS	330*1	2	~0.3~0.5	60
华电莱城电厂 Huadian Laicheng PS	300*1	2	~1.13	42.7
广东粤电惠来电厂 Guangdong Yuedian Huilai PS	600*1	1	~0.59/1.11 (LP)	50*2
大唐乌沙山 Datang Wushashan PS	660*1	2	~1.2	71*2
广东粤电湛江电厂 Guangdong Yuedian Zhanjiang PS	600*1	1	0.5~1.6	73*2
河南豫能鹤壁丰鹤电厂 Henan Yuneng Fenghe PS	660*3	6	2克煤/KWH	90*6
浙江神华国华宁海电厂 Shenhua Guohua Ninghai PS	1000*1	2	~0.36 (LP)	74*2
河南平顶山电厂 Henan Pingdingshan PS	1000*1	2	~0.45	156*2

注：1、一台600MW机组，按照凝汽器每降低1kPa，煤耗节约1.97g/KWH考虑，年运行6000小时计算，如果背压降低0.5kPa，年节省的燃煤量约为3500吨，节省的成本超过200万元，这远高于真空泵设备的价格。
2、凝汽器背压影响因素很多，在不同的季节和工况下，背压降低的值也有差异。以上数据基于电厂改造前后某相同工况下的比较。



为客户提供全新的售后服务标准，
无论在客户现场还是在Nash服务中心，我们都可以为您的
Nash、Hoffman、Lamson产品及其他液环真空泵设备
离心风机提供专业的服务。

Nash now offers a new standard in aftermarket support for our customers. From onsite preventive maintenance to a network of service and repair centers, we can provide total life cycle management for your Nash, Hoffman or Lamson equipment - or any other liquid ring or centrifugal blower product.

服务, 很多公司都可以提供……
我们提供专业化的服务

Nash, Hoffman和Lamson致力于为客户提供随时随地的支持，以保证设备的平稳、高效的运行，及时排除故障，避免长时间待机。

我们可以为您的真空压缩或鼓风机系统提供包括安装、调试、保养和故障处理在内的总包服务。同时我们拥有专业的设备和工具，可以对各类设备进行改造和翻新。

我们的服务中心拥有经验丰富的专业人员，确保您的返修设备的关键性能达到新产品的标准。

Some Companies Offer Service...
We Specialize in Service

Nash, which includes Hoffman & Lamson, has a service organization that is ready to provide support to keeping your process running smoothly and efficiently and to avoid extensive equipment downtime.

We have the capability to provide turnkey service for installation, startup, preventive maintenance and troubleshooting your vacuum, compressor or blower system. Our facilities are fully equipped with material handling equipment, tooling, fixtures and special machines to handle rebuilding and overhauling pumps, compressors, blowers and engineered systems.

Our service centers are staffed by skilled, experienced people working with current drawings and specifications, to insure that all critical tolerances are returned to that of a new pump or blower.

NASH 真空系统数智化解决方案

产品优化设计

- 智能变频控制系统
- 高真空专利技术
- 防汽蚀专利技术和预警系统
- 预防性维护模块，实现实时诊断、见解和预防信息
- 真空监测和流量调节
- 环境友好型隔音罩设计（可选）
- 集成化设计，简单插接
- 就地或远程控制可切换，液晶屏操控简单清晰
- IIOT 模块（可选）



智能运维成功案例：

- 节省能耗 34%
- 智能算法有效预防数次气蚀倾向
- 助力系统节煤，提升生产效率
- 预防性维护有效降低运维成本约 25%
- 实现智慧电厂对真空系统智能运维的数字化需求



湖北某电厂智能真空系统



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