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能效牧风 节能先锋

MOAIR

苏州牧风压缩机设备有限公司

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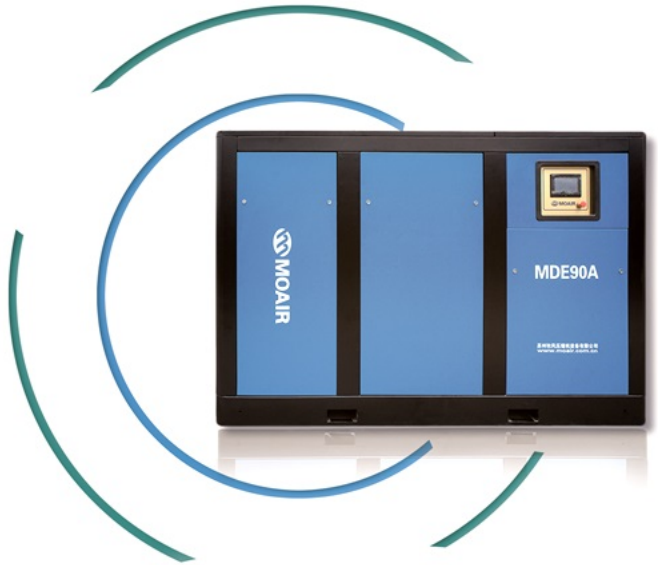
MOAIR

两级压缩螺杆式空气压缩机

Two stage screw air compressor



节能·高效·环保

苏州牧风压缩机设备有限公司
SUZHOU MOAIR COMPRESSOR EQUIPMENT CO.,LTD.

公司简介
COMPANY PROFILE

苏州牧风压缩机设备有限公司位于江苏省常熟市高新经济技术开发区，是永磁同步变频常压系列、永磁同步低压系列、永磁同步两级压缩系列、无油压缩机等不同类型空压机产品的专业制造企业。

牧风以十余年的螺杆压缩机专业制造技术的沉淀，携国际一流的永磁同步驱动及控制技术。

以最新的螺杆专利型线及加工设备，全力研发更为节能的压缩机，引领压缩机节能环保新潮流，产品已达到或超越国家一级能效标准。

公司产品广泛应用于机械、轻工、纺织、食品、石油、化工、冶金、矿山、电力、城建、医学研究和国防科研等行业，为国家节约能源做出巨大贡献。

Located in Changshu High-tech Economic Development Zone, Changshu City, Jiangsu Province, Suzhou Moair Compressor Equipment Co., Ltd. is a professional manufacturer of the air compressor products of various types including the permanent-magnet synchronous variable-frequency series, permanent-magnet synchronous low-pressure series, permanent-magnet synchronous two-stage compressors series, oil-free compressors, etc.

Thanks to more than 10 years of professional screw compressors manufacturing technology, Moair is bringing the international first-class permanent magnet synchronous drive and control technologies.

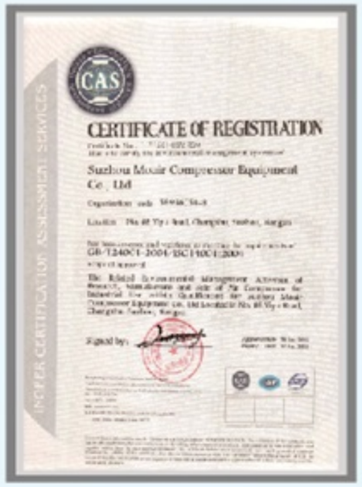
By relying on the latest patented rotor profile and equipment, it is going all out to develop more energy-efficient compressors, and to lead the new trend of compressor energy saving and environmental protection. Accordingly, it's products have reached and surpass the national energy efficiency standards.

Our products are widely used in the industries including the machinery, light industry, textile, food, petroleum, chemical industry, metallurgy, mining, electric power, urban construction, medical research and national defense scientific research and so on. Hence, it has made great contributions in energy conservation for the country.

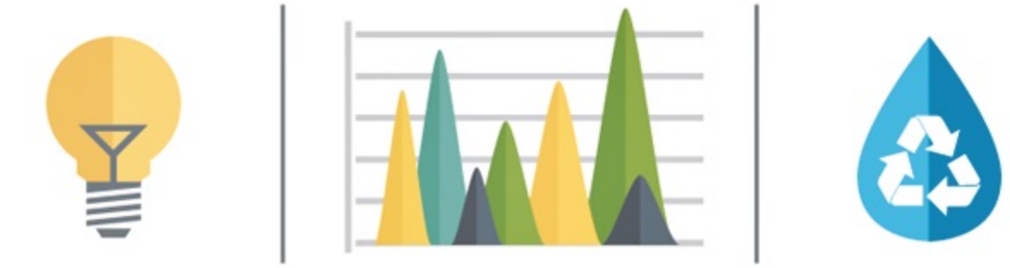
MOAIR

Certificate

▶ 14001证书
14001 Certificate



▶ 质量管理体系证书
Quality Management System Certificate



节能
SAVING-ENERGY

高效
HIGH-EFFICIENCY

环保
ENVIRONMENTAL-FRIENDLY

现有企业使用压缩机的状态及永磁机的优势

Situation of existing enterprises using compressors and the advantages of the permanent magnet machine

压缩机是绝大多数企业的高耗电设备，据行业协会调查，98%的用户在空压机选型时因为考虑到压力损耗会在原统计用气量的基础上增加15-25%的余量，并且按照全部用气设备同时开启所需最大用气量来计算，直接导致绝大部分压缩机实际用气量在压缩机额定排气量的50-70%之间，而常规压缩机往往在95%用气量时能效达到最佳点，其能效随着客户用气量的降低会大幅度降低（详见能效曲线图）。

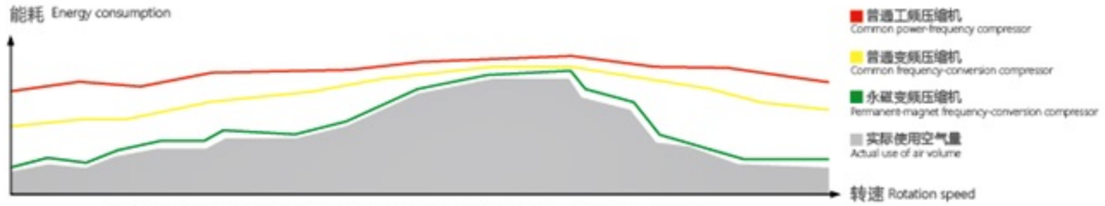
目前很多用户为了解决这个问题，采用了变频技术，即在用气量到某个平均值时，让压缩机电机也维持在相对应的转速，虽然比常规压缩机节能，但从所附的能效曲线图中我们可以看出，由于电机是异步电机，随着转速的降低其能效也会大幅度降低，导致节能效果不能达到理想状态，并且因为电机温升的提高而严重影响压缩机的稳定性。

而我司目前推出的牧风永磁同步变频压缩机，囊括了变频压缩机、同步电机及永磁稀土电机的各种优点，使得能效大幅度提升，经实验和大量用户实际使用证明，99%的客户可以节能20%-27%，80%的用户节能效果达到34%-46%。

Compressors are the high power consumption equipment of the vast majority of enterprises. According to the survey of industry association, 98% of users will increase the margin of 15-25% on the basis of the original air consumption in statistics after taking into account the pressure loss, and they will calculate at the maximum air consumption required for the running of all the gas consuming equipment at the same time, which directly leads to the result that the actual gas consumption of vast majority of the compressors are between 50 to 70% of the compressor rated displacement. While the conventional compressor can often achieve the best energy efficiency point when the gas consumption is at 95%, and the energy efficiency will be significantly reduced with the decreasing of customers' gas consumption (see energy efficiency curve for details).

At present, in order to solve this problem, many users resort to the use of inverter technology, that is, to maintain the compressor motor at the corresponding revolving speed when the gas consumption is at certain average. Although it is more energy saving than conventional compressors, we can see from the attached figure of energy efficiency curve, as the motor is an asynchronous type, its energy efficiency will be greatly reduced along with the decrease of the rotational speed; thus resulting in the energy saving effect cannot reach the ideal state. Moreover, the stability of the compressor will be seriously affected along with the rising motor temperature.

However, the Moair PM screw compressor introduced in the company has included the various advantages of the VSD compressor, synchronous motor and PM rare earth motor, which enables the significant enhancement of energy efficiency. As proved by the experiment and the actual use by a large number of users, 99% of the customers can save energy from 20% to 27%, and 80% of users can achieve 34% to 46%.



■ 相对普通工频和变频空压机，永磁变频压缩机在低使用率时，能耗更低，更节能！
Compared with common power-frequency and frequency-conversion compressors, the energy consumption of permanent-magnet frequency-conversion compressor is lower and has more energy conservation if it has low usage.

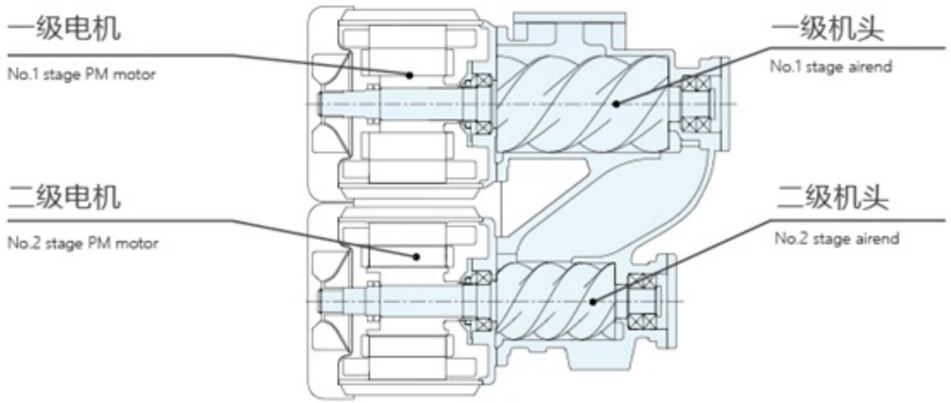
能效曲线图
Energy-efficiency curve diagram

压缩机发展趋势
Development Trend of Compressors

苏州通润驱动设备有限公司，具有16年的永磁同步驱动设备制造经验，10年螺杆转子加工经验，以其大强的研发实力为后盾，精心设计出永磁双变频主机，全部采用进口SKF重载精密轴承：承受更高载荷，具有较低的噪声，大大的降低运行成本，增加机器运行可靠性等优点。

With 16 years of manufacturing experience in the permanent magnet synchronous drive equipment and 10 years' experience in screw rotor processing, Suzhou Torin Drive Equipment Co., Ltd. has designed the refined permanent magnet dual frequency airend by relying on its powerful R&D strength. All products are featured with the imported SKF heavy-duty precision bearings, which are featured by supporting higher fixed load, lower noise, and thus it can greatly reduce running costs and increase machine running reliability and so on.

无齿轮、双永磁电机、双级压缩
Gealess、Two-IPM motors、Two-stage screw



节能 高效 环保
SAVING-ENERGY HIGH-EFFICIENCY ENVIRONMENTAL-FRIENDLY

牧风永磁变频双螺杆空气压缩机5大优势
Five major advantages of Moair Permanent Magnet VSD Twin-Screw Air Compresso

01

无齿轮箱：高效永磁同步电机与螺杆阳转子采用内嵌式一体连轴直连结构，无需齿轮传动，彻底消除齿轮点蚀或断齿隐患。

无联轴器：两个独立永磁电机一体式直接驱动两个压缩主机。无联轴器故障隐患。

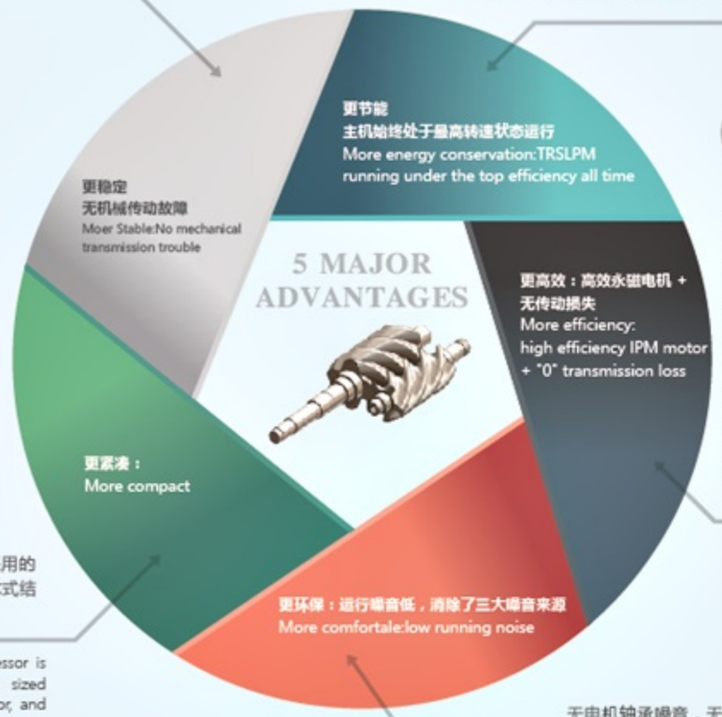
No gear box: The high-performance permanent magnet synchronous motor is connected with the screw male rotor via the integrated one-axis direct link structure without gear transmission. Therefore, it can completely eliminate the gear pitting or the potential gear breakage.

No coupling: Two independent permanent magnet motors are integrated to directly drive respective airend. Hence, there is no hidden danger of coupling failure.

02

牧风永磁双极压缩机采用两个独立永磁电机驱动，全程智能控制，通过控制排气压力和级间压力，使主机在不同转速，不同压力的情况下，始终运行在最佳级间压力点。运行时自动计算出各自的最佳运转速度，通过最好的匹配平衡压缩比，压缩机始终处于最佳运行状态，获得最好效率。

Moair PM two-stage compressor is driven with two independent permanent magnet motors, which is intelligently controlled in the whole process. Through the control of the inter-stage pressures, the airend is enabled to be always running in the best inter-polar pressure point at different speeds and pressures. The optimum operating speed is calculated automatically during the operation, and the compression ratio is balanced through the best matching, so that the compressor can always run at the balanced compression ratio, and obtain the best efficiency.



03

牧风两级压缩机配备高效永磁同步IP54电机，节能性能卓越。在低频低速时，永磁同步电机持续保持高效。

The Moair two-stage compressors are equipped with highly efficient permanent magnet synchronous IP54 motor, which is featured by the excellent energy conservation performance. At the low-frequency and low-speed, the permanent magnet synchronous motor can maintain high efficiency continuously.

05

牧风两级压缩机采用的永磁电机体积小，一体式结构节约空间

Moair two-stage compressor is featured with a small sized permanent magnet motor, and the integrated structure can save space.

04

无电机轴承噪音，无齿轮啮合噪音，无联轴器传动噪音

No motor bearing noise, no gear meshing noise, no coupling drive noise

永磁变频两级压缩螺杆式空气压缩机
Permanent Magnetic VSD Two-stage Compression Screw Air Compressor

主机 Airend

采用通润主电机一体式主机，无磨损的型线设计，保证了机头足够长的使用寿命，效率高、寿命长、噪音低，有较高的性价比。

机头自配双驱永磁变频电机. 具有效率高、启动转矩大、噪声低、结构更加合理、外形新颖美观等特点。

Featured with the integrated airend of Torin motor, the wear-free profile design ensures the long service life of the airend. The high efficiency, long service life and low noise constitute the high performance-price ratio.

The machine head is equipped with the dual-drive permanent magnetic variable frequency motor. It is featured with the characteristics such as high efficiency, large starting torque, low noise, more reasonable structure, novel and aesthetic appearance and so on.

双驱双变频
Dual drive and dual frequency conversion

兼风扇变频,极大节能。

Fan frequency conversion, great energy saving.

空气滤芯 Air filter element

唐纳森高效过滤器，旋风分离+纳米涂层精密过滤。

Donaldson efficient filter, cyclone separation + nano-coating precision filter.

油气分离器 Oil and gas separator

采用切向进气，旋风分离的结构能使润滑油的二次回油达到300~600PPM水平，减轻了油精分的负担，延长了使用寿命。

By using tangential intake, the cyclone separation structure can make the secondary oil returning of the lubricating oil to the level of 300 – 600 PPM; thus reducing the burden of oil fine separator, and extending the service life.

冷却器 Cooler

采用吸风式冷却方式，冷却器冷却区域风速非常均匀:4.5--5m/s，极大的提高了冷却器的使用效率，最高使用环境温度可达46℃。

By using the suction cooling, and the air speed at the cooler cooling zone is very uniform: 4.5 - 5m/s, which has greatly improved the use efficiency of the cooler, and the maximum ambient temperature in use is up to 46 ℃.

风机 Fan

德国Rosenberg离心风机，噪音低,风压高。
（以MDE160A为例）
消耗功率<3.0kW
传统机型：4.4kW
可节约功率1.4kW

Germany Rosenberg centrifugal fan, which is featured by low noise and high wind pressure.(e.g. MDE160A)
Power consumption <3.0kW
Traditional models: 4.4kW
It can save power of 1.4kW

机油滤 Oil filter

专业制造的滤芯，能有效除去油中杂质如金属微粒，油的劣化物等，对轴承及转子有完善的保护作用。

The professionally manufactured filter can effectively remove impurities in oil such as metal particles, oil degradation, etc., which has a perfect protection on the bearings and the rotors.

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永磁变频两级压缩螺杆式空气压缩机

Permanent Magnetic VSD Two-stage Screw Air Compressor

1 两级压缩采用等压比 设定级间压力，故每级压缩比都要低于单级压缩比，降低了转子间的回流泄露，提高了容积效率和绝热效率。

The two-stage compression uses equal pressure ratio to set the inter-stage pressure. Therefore, the compression ratio of each stage is lower than the single-stage compression ratio; thus reducing the backflow leakage between the rotors and improving the volumetric efficiency and adiabatic efficiency.

2 空气经过第一级压缩后，通过级间强化喷油冷却器，降低二级吸气温度，整个压缩过程接近等温压缩，有效降低压缩功。正常工况下，比单级压缩可节能约15%。

After the first stage of air compression, the No.2 stage suction temperature is reduced through the inter-stage oil injection cooling. The entire compression process is close to isothermal compression, which can effectively reduce the compression power. Under the normal working conditions, it can save energy of about 15% over single-stage compression.

3 专门的维护空间，便于服务人员清扫和维护。

Special space is convenient for service staffs to do cleaning and maintenance.

MDE系列技术参数表

MDE series technical parameter table

型号 (Model)	功率 (kw)	排气量/排气压力 (m3/min)/ (Mpa)				机组重量 (kg)	外形尺寸 (L*W*H) mm	出口尺寸 diameter
MDE-45A	45	11.1/0.6	10.1/0.7	9.9/0.8	9.0/1.0	1750	2380*1300*1660	DN50
MDE-55A	55	13.4/0.6	12.7/0.7	12.4/0.8	10.9/1.0	2250	2380*1300*1660	DN50
MDE-75A	75	19.8/0.6	18.4/0.7	17.3/0.8	15.4/1.0	2650	2900*1650*1890	DN65
MDE-90A	90	23.0/0.6	21.8/0.7	20.1/0.8	18.1/1.0	2660	2900*1650*1890	DN65
MDE-110A	110	26.0/0.6	25.5/0.7	24.3/0.8	21.5/1.0	2660	2900*1650*1890	DN65
MDE-132A	132	31.1/0.6	30.5/0.7	28.1/0.8	23.8/1.0	4160	3200*1880*1890	DN80
MDE-160A	160	40.6/0.6	38.3/0.7	35.7/0.8	30.4/1.0	4220	3200*1880*1890	DN80
MDE-185A	185	40.0/0.7	38.5/0.8	32.0/1.0	28.6/1.25	4400	3200*1880*1890	DN80
MDE-200A	200	42.5/0.7	41.5/0.8	37.0/1.0	32.0/1.25	4700	3400*2000*2050	DN100
MDE-220A	220	50.0/0.7	46.0/0.8	39.0/1.0	33.0/1.25	8100	4200*2150*2250	DN125
MDE-250A	250	54.0/0.7	51.0/0.8	41.0/1.0	39.0/1.25	8550	4200*2150*2250	DN125
MDE-280A	280	60.0/0.7	57.0/0.8	49.5/1.0	43.0/1.25	8730	4200*2150*2250	DN125
MDE-315A	315	67.0/0.7	62.0/0.8	56.0/1.0	51.0/1.25	10000	5000*2150*2300	DN125
MDE-355A	355	73.0/0.7	69.0/0.8	61.0/1.0	54.0/1.25	10180	5000*2150*2300	DN125

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两级压缩螺杆式空气压缩机

Two-stage Screw Air Compressor

1 · 两级压缩采用等压比 设定级间压力，故每级压缩比都要低于单级压缩比，降低了转子间的回流泄露，提高了容积效率和绝热效率。

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2 · 空气经过第一级压缩后，通过级间强化喷油冷却，降低二级吸气温度，整个压缩过程接近等温压缩，有效降低压缩功。正常工况下，比单级压缩可节能约15%。

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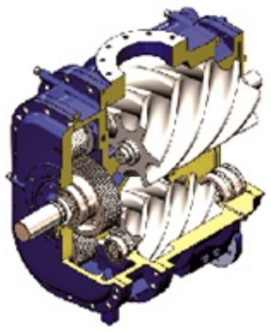


3 · 主机采用大转子，低转速、低噪音设计。

The airend is driven with big rotor, which is designed with low speed and low noise.

4 · 共机壳设计，内含两个独立压缩单元，提高了一、二级的安装精度。

Design with the integrated housing, it contains two independent compression units, which improved the installation accuracy of the first and second stages.

5 · 斜齿轮直接传动，每个转子获得最优转速比。

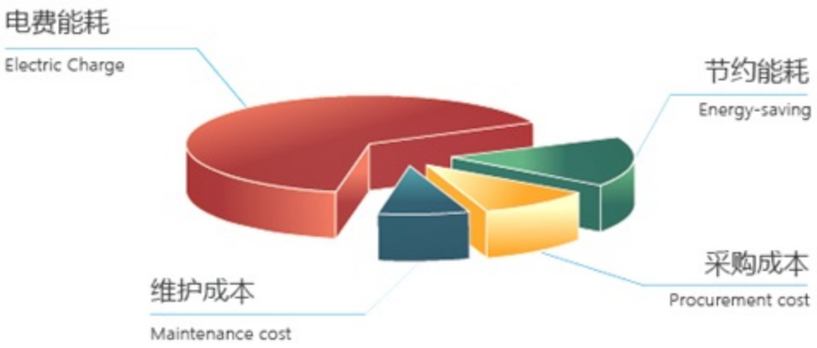
The direct driven with high precision helical gear ensures that each rotor can obtain the best speed ratio.

MFD系列技术参数表

MFD series technical parameter table

型号 (Model)	功率 (kw)	排气量/排气压力 (m3/min)/ (Mpa)					机组重量 (kg)	外形尺寸 (L*W*H) mm	出口尺寸 diameter
MFD-132A	132	35.0/0.6	28.5/0.7	28.0/0.8			4140	3200*1880*1890	DN80
MFD-160A	160	37.0/0.6	35.5/0.7	35.0/0.8	28.0/1.0		4220	3200*1880*1890	DN80
MFD-185A	185	40.4/0.6	37.5/0.7	37.0/0.8	35.0/1.0	28.0/1.25	4400	3300*1880*1890	DN80
MFD-200A	200	40.9/0.7	40.4/0.8	37.0/1.0	35.0/1.25		4700	3400*2000*2050	DN100
MFD-220A	220	50.0/0.7	46.0/0.8	39.0/1.0	33.0/1.25		7950	4200*2150*2250	DN125
MFD-250A	250	54.0/0.7	51.0/0.8	41.0/1.0	39.0/1.25		8350	4200*2150*2250	DN125
MFD-280A	280	60.0/0.7	57.0/0.8	49.5/1.0	43.0/1.25		8550	4200*2150*2250	DN125
MFD-315A	315	67.0/0.7	62.0/0.8	56.0/1.0	51.0/1.25		9000	5000*2150*2300	DN125
MFD-355A	355	73.0/0.7	69.0/0.8	61.0/1.0	54.0/1.25		10000	5000*2150*2300	DN125

节能-两级压缩空压机终身使用成本分析
Energy-saving,Two-Stage using cost analysis



两级压缩节能效果
Energy-saving effect of two-stage compression

两级螺杆空压机除了秉承普通双螺杆空压机具有的结构简单，安装灵活以及高效率的优点外，还凸显出自身更加高效，节能的优点

• 根据工程热力学理论，空压机在压缩过程中等温压缩最省功。双级压缩喷油螺杆空压机就是在上述两种方式的基础上，在两级压缩过程中将喷油的冷却功能充分完善，再加上级间冷却，在确保压力露点温度之上，尽量的接近于等温压缩，实现节能的效果。

• 同时，因为双级压缩螺杆机的压缩比低，其在压缩过程中的“内泄漏量”与同功率、同等排气压力的单级压缩螺杆机相比要大大降低，反之即提高了排气流量，意味着效率提升，即比功率的降低。

• 相对于市场上普通的永磁两级压缩机，牧风采用双驱两级压缩，直接避免了齿轮组内部的功率损耗.
节能优点：①可降低轴承负载，提高容积效率；
②在部分负载情况下运转时，更能提高效率，节能。
③两级螺杆空压机比双螺杆空压机节能高达15%-25%，每年可节省客观的电费。

In addition to having the advantages such as simple structure, flexible installation and high efficiency of the ordinary twin-screw air compressor, the two-stage screw air compressor is also highlighted with its advantages of being higher efficient and energy-saving.

• According to the engineering thermodynamics theory, it is the most economical for the compressor with isothermal compression. Two-stage oil-injection screw air compressor is designed based on the above theory, it fully improves the cooling function through oil injection during the two-stage compression, plus the inter-stage cooling, by ensuring the temperature is above the pressure dew point, it can be close to isothermal compression as possible, so as to achieve the energy-saving effect.

• At the same time, due to low compression ratio of the two-stage airend, the "internal leakage" is largely reduced in the compression process compared with the single-stage compression airend with the same power and same discharge pressure. On the contrary, the diplacement is increased, which means that the efficiency is increased, and the specific power is reduced.

• Compared with the ordinary two-stage permanent magnetic compressor on the market, Moair uses the dual-drive and two-stage compression, which directly avoids the power loss inside the gear set.

Energy-saving advantages:
① To reduce the bearing load, and improve the volumetric efficiency;
② In the case of partial load operation, it can improve efficiency and become energy saving to a better extent.
③ The energy saving of two-stage screw air compressor is up to 15% -25% than that of the one-stage air compressor, which can save the considerable electricity fees every year.