



ECO AIR

永磁变频螺杆式空压机

Permanent Magnet Frequency Conversion Screw Air Compressor




A
bout us



艾高简介

广东艾高装备科技有限公司是国内领先的螺杆式空压机制造商，专业的永磁变频空压机制造商，是节能空压机服务提供商。为了让每个企业都能获得优质、节能、可靠的压缩空气体验，公司引进德国螺杆式空压机先进生产技术，秉持“科学管理、精益求精、注重细节、守约诚信”的质量方针，生产的空压机通过了 ISO 9001:2008 国际质量体系认证，并获得一系列国家权威机构颁发证书；同时，公司打造了一支为客户提供 24 小时“服务+”的成熟团队。

GUANGDONG ECOAIR EQUIPMENT TECHNOLOGY CO., LTD. is a leading manufacturer of rotary screw air compressors in China, a professional manufacturer of permanent magnet variable speed air compressors and an excellent service provider of energy-saving air compressors. In order to enable every enterprise to experience quality, energy-saving and reliable compressed air, the Company has introduced advanced production technology of rotary screw air compressors from Germany. Adhering to quality guidelines of "scientific management, constant striving for perfection, paying attention to details and keeping faith", its air compressors have been certified by ISO 9001:2008 international quality system and a series of national authorities; besides, the Company has set up a mature team to provide customers with 24h "service+".





- A 先进水平的一体式主机
- B 高效节能的永磁电机
- C 高效的离心风机变频控制系统
- D 彩色触摸屏微电脑控制系统
- E 油过滤器



- F 油气分离器
- G 进气阀
- H 空气过滤器
- I 高效冷却器

A 先进水平的一体式主机

世界顶级螺杆主机，高效率，低转速，转子采用第三代5.6齿型，全球最佳型线设计，低噪音，低能耗，低维护费用，最佳的可靠性和使用性。

永磁电机与压缩机主机采用内嵌式一体轴直连结构，结构更加紧凑，传动效率100%。

没有电机轴承，带有永磁体的转子直接安装在阳转子的伸出轴上，这种结构无需使用轴承，从而消除了电机轴承的故障点。

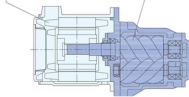
World-class rotary screw main machine, high efficient, low rotating speed, 3rd generation of 5.6 tooth-type rotor, world leading molded line design, low noise, low energy consumption, low maintenance cost, most reliable and practical.

The permanent magnet motor and the compressor are assembled to be embedded integral-shaft direct-connecting structure. The structure is more compact and its transmission efficiency reaches 100%.

There is no motor bearing. The permanent magnet rotor is installed on the projecting shaft of the male rotor directly, and this structure doesn't need bearing, so it has no failure of motor bearing.

高效率永磁电机
High-Efficiency PM Motor

螺杆转子
New Screw Rotor



B 高效节能的永磁电机

通过与定子线圈相关的交流电压产生的磁场及磁场的磁力使转子产生转动的电机。

This motor enables the rotor to rotate via the magnetic field generated by AC voltage of the stator coil and the magnetic force of the magnetic field.

节能 Energy Conservation



高效的永磁电机 (PM 电机)，与普通变频电机相比，节能性能更优越；

尤其电机低转速时，永磁电机仍能保持很高的电机效率。

In contrast to common frequency modulation motor, the efficient permanent magnet motor (PM motor) can save more energy. Particularly, when the motor rotates at low speed, the permanent magnetic motor can still keep very high motor efficiency.

稳定 Stable



永磁同步电动机 (PM 电机) 采用高性能钕铁硼永磁体，120°C 不失磁；

定子线圈采用变频器专用耐电晕漆包线，绝缘性能卓越，使用寿命更长；

同步电动机响应速度快，在排气响应上表现卓越；

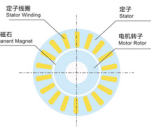
能够实现软启动，运行时，电机电流不会超过满载电流，同时也大大减小了对电网设备

的冲击，不会对用电设备造成危害。
The permanent magnetic synchronous motor (PM motor) is made of high efficiency Nd-Fe-B permanent magnet; it will not loss of field at 120°C. The stator coil is made of special corona-resistant enamelled wire coatings for transducers. It is of excellent insulation performance and long service life. The synchronous motor responds rapidly and is excellent in exhaust responsibility. It can realize soft start. While running, current of the motor will not exceed the full-load current. Besides, it reduces the impact to grid equipment and will not damage electrical equipment.

体积小 Small Size



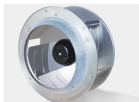
电机体积小，一般约为普通变频电机尺寸的 1/3，便于拆装。
The motor is compact in size and its overall dimension is about 1/3 of common frequency modulation motor, so it is easy to assemble and disassemble.



C 高效离心风机变频控制系统

Efficient Centrifugal Fan Frequency Conversion Control System

- 1.离心式冷却风扇采用变频控制,节能约为50%;根据排气温度,控制风扇的转速,抑制电力的浪费,同时因为稳定了系统及整体的部件温度,从而提高了部件的耐久性。因为风扇的变频控制,从而使噪音进一步降低;
- 2.离心风机更具有高效率,低噪音、压力曲线平稳等优异特性。
1. Centrifugal cooling fan applies frequency conversion control and can save about 50% energy. It controls speed of the fan according to exhaust temperature and prevents electricity waste. Besides, it keeps temperature of the system and all parts stable and improves durability of parts. As the fan is controlled by frequency conversion, its noise is further reduced;
2. The centrifugal fan is featured in high efficiency, low noise, and stable pressure curve, etc.



D 彩色触摸屏微电脑控制系统

Color Touch Screen Microcomputer Control System

- 1.先进的微电脑控制系统实现智能控制、变速控制气量自动调节、负载启动、软启动;
- 2.电流涌动的消除以及部件使用寿命的延长,这样大大的增加了系统的可靠性;
- 3.智能动态控制,动态显示压缩机各个部件的工作状况,实时直观的压力、温度、电流工作曲线;
- 4.超大内存 8M flash ROM + 16M SDRAM,可贮存上千条的历史故障记录;
- 5.配有打印接口,可随时打印压缩机的工作信息表, RJ45 以太网接口,支持 HMI 与以太网控制器或 PC 互联。
1. Advanced microcomputer control and driving system realizes intelligent control, automatic adjustment of variable speed air volume control, load start and soft start;
2. Current flowing is eliminated, and service life of parts is extended, so reliability of the system is improved largely;
3. Intelligent and dynamic control, display working condition of every part of the compressor dynamically, real-time and visual pressure, temperature and current working curve;
4. Very large memory; 8M flash ROM + 16M SDRAM, save thousands of historical failure records;
5. It is equipped with printer interface and can print work information table of the compressor at any time; RJ45 Ethernet interface, support interconnection with HMI and Ethernet controller or PC.



E 油过滤器

Oil Filter

采用航空用高标准材料过滤的旋装式油过滤器,效果比常规滤芯高 20%,有效延长主机正常使用寿命。

It is equipped with the rotary-type oil filter made of high-end material for aviation. Its effect is 20% higher than that of common filter element, so it extends normal service life of the compressor effectively.



F 油气分离器

Oil-Air Separator

超大容量的油气分离器,品质优越的油气分离元件和液、液过滤元件,配以设计先进的三次油气分离,含油控制在 3ppm 以下,保证压缩空气的高质量。

Ultra high capacity oil-gas separator, excellent oil-gas separation elements, gas and liquid filter elements and advanced 3-time oil-gas separation design keep oil content below 3ppm and ensure high quality of compressed air.



G 进气阀

Air Inlet Valve

设计先进的气阀,进气调整范围 0-100%,容量调节,压力损失小,动作稳定,寿命长。

Advanced design of the air valve, adjustment range of inlet air: 0-100%, adjusted by the capacity regulating valve, featured in low pressure loss, stable running and long service life.

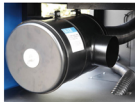


H 空气过滤器

Air Filter

采用具有较高容尘能力和较低的流动阻力设计,可滤除空气中的微小固体颗粒,除尘效果达 99.5%,确保系统的各个零部件功能正常运行和经济的使用寿命。

High dust holding capacity and low flow resistance design is applied, so it can filter tiny solid particles in air, reaches 99.5% dust removal efficiency and makes sure normal running and long service life of every part of the system.



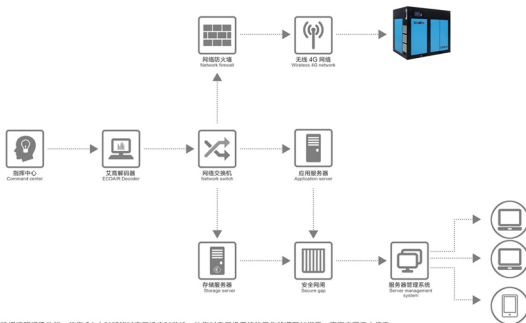
I 高效冷却器

Efficient Cooler

采用超大换热面积设计,提高冷却效率,有效防止机器高温,内室做防腐处理,适应更恶劣的工况,延长使用寿命。

It has large heat exchange area design, so it can improve cooling efficiency and prevent the machine from high temperature effectively. Antiseptic treatment is carried out to its inner wall, so it is applicable for severe working conditions and its service life is extended.





1. 可选择远程通讯功能, 使您 24 小时都能对空压机实时监控, 让您对空压机系统的工作状况了如指掌, 真正实现无人值守。

2. 多达三个用户手机设置方便用户及时了解空压机出现的异常信息。

3. 机器的实时监控。

1. Remote communication function is optional. It enables users to monitor the air compressor at 24h and to follow working conditions of the air compressor system and realizes real unattended operation.

2. Phone setting of three users are available and are convenient for users to know abnormal information of the air compressor.

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3. Real-time monitor of the machine.



1. 一台艾高 PLC 作为主站, 分别与三台艾高空压机变频器的 PLC 编程卡进行 RS485 通讯, 站号任意标定, 实现启动、停止、压力 / 温度、空压机轮换等控制功能;

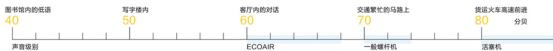
2. 每台艾高空压机配置一台 HMI 和 PLC 编程卡进行 RS422 通讯, 实时读取变频器的运行状态、电流 / 功率、压力 / 温度等显示参数, 也可作为在单机模式下独立的控制;

3. PC 机可以安装组态软件与 PLC 通讯, 用作后台的监控, 实时进行数据读取和发送, 来控制系统的运行。

1. A ECOAIR PLC is used as the master station and runs RS485 communication with the programming cards of 3 ECOAIR compressor transducers respectively; station number is calibrated randomly; it realizes start, stop, pressure/temperature and air compressor alternative control functions.

2. Every ECOAIR air compressor is equipped with a HMI and PLC programming card for RS485 communication. It can read real-time running status, current/power, pressure/temperature, and other display parameters of transducers and may control separately at standalone mode.

3. PC may be equipped with configuration software and PLC communication. As the background monitor, they can read and send data in real time and control operation of the system.



噪音低 Low noise



正常运行 67dB, 低运行噪音使其适用的场合更广。
67dB at normal running. Because it is low in noise, it can be applied widely.

自动排量控制 Automatic displacement control



在排量控制功能开启后, 变频器在恒功率输出中, 一个压力自动对应一个最大频率, 使得变频器运行在较低目标压力下能提供更多排气量, 并且在较高目标压力下安全运行不超功率。
When the displacement control function is started, the transducer outputs at constant power and a pressure corresponds the highest frequency automatically, so that the transducer can provide more gas displacement when it runs at low target pressure and run safely and doesn't exceed power when it runs at high target pressure.

“工业管家”功能 “Industrial housekeeper” function



艾高压缩机系统, 可以根据您工厂的工作时间预先设定每周的工作时间表, 压缩机会按照设定好的工作时间表, 准时的自动开机和关机, 真正实现设备实现 24 小时无人值守。
ECOAIR compressor system may preset working schedule of every week according to working time of your factory, and the compressor will be turned on or off automatically according to the preset working schedule, so it realizes 24h unattended operation of the equipment.

智能 PID 功能 Intelligent PID function



防止用气量迅速变化时空压机系统的频繁加卸载, 延长使用寿命, 其功能下的压力 PID 调节更灵敏可控, 即使在用气量变化较大的场合, 也能防止空压机过多卸载, 降低因用气量变化较大问题而使压缩机来不及降低转速而多余浪费的能源。
prevent the air compressor system from frequent loading and unloading when gas consumption changes quickly, extend service life. Under this function, pressure PID adjustment is more sensitive and controllable; it can prevent excessive unloading of the air compressor even the gas consumption changes largely and reduce redundant energy waste when the gas consumption changes largely and the compressor has no enough time to slow down.

杜绝无用功损耗 Avoid idle consumption



压力传感器检测排气口的压力, 把信号传输给 PLC, PLC 根据压力传感器的压力大小来控制变频器的输出频率, 当压力大时, 减小频率; 当压力小时, 增大频率使压力始终恒定, 压缩机通过变频器来控制永磁电机转速这样就组成了一个变频闭环控制系统, 实现恒压供气、多用少产、少用少产、不用即停、有用即起启动产气, 彻底杜绝了无用的能源损耗。

The pressure sensor detects pressure of the air outlet and sends signal to PLC; PLC controls output frequency of the transducer according to pressure of the pressure sensor. When the pressure is high, decrease the frequency; when the pressure is low, increase the frequency to keep the pressure constant. The compressor controls speed of the permanent magnet motor via the transducer, so it forms a variable speed and closed-loop control system, realizes air supply at constant pressure, produces air according to demand, stops production when air is not used, starts production by soft start when air is used; thus, it avoids idle consumption thoroughly.



适合系统用气量波动大、负载低的工况

Applicable for working conditions which are high in gas consumption fluctuation and low in load

变频范围从 25%~100%, 系统用气量波动越大, 节能效果越明显。

Frequency range from 25%~100%; if system consumption fluctuation is bigger, the energy-saving effect will be more obvious.

负载工况状态 (%) Load working status	一般螺杆式空压机用电量 (度) Power consumption of common rotary screw air compressor	艾高永磁变频空压机消耗 (度) Power consumption of ECOAIR permanent magnet air compressor	省电度数 (度) Saved power	节能率 (%) Energy-saving rate
25	100	40	60	60
50	100	50	50	50
75	100	70	30	30
100	100	90	10	10

贵在省钱

购买空压机时，传统意义上的成本（即购买成本+保养成本），其比例只占到总成本的25%，而能源消耗却占到了75%。

普通（变频）空压机比普通（工频）空压机节能22-30%；

艾高永磁变频空压机比普通（工频）空压机节能33-40%。

When we buy air compressors, traditional cost (namely purchase cost+maintenance cost) is only 25% of total cost; the cost of energy consumption is up to 75%.

Common (frequency conversion) can save 22-30% energy more than that of common (power frequency) air compressor;

ECOAIR permanent magnet variable speed air compressor can save 33-40% energy more than that of common (power frequency) air compressor.

1. 一台75KW的普通空压机，一年运行8000小时，电费0.62元/度，一年的电费为75kWx8000h x 0.62元/(kW·h) = **37.2万元**

2. **艾高永磁变频75KW的空压机，一年可节约大约35%的电费**，共计37.2万元 x 35% = 13.02万元；

3. 投资回收期(ROI)约1年。

1. If a 75KW common air compressor runs 8,000h/year and the electric charge is RMB0.62/Kwh, electric charge of one year is

75kWx8000h x RMB0.62/(kW·h) = RMB372,000;

2. ECOAIR permanent magnet variable speed 75KW air compressor can save about 35% electric charge per year, totally

RMB372,000x35% = RMB130,200;

3. Return of investment (ROI) is about 1 year.



普通（工频）空压机
ordinary(power frequency)



普通（变频）空压机
ordinary(frequency conversion)

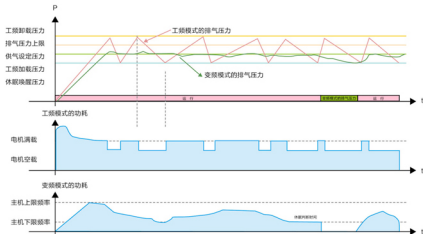


艾高永磁变频空压机
ECOAIR PM frequency

一年运行8000小时，直接省电：

Run 8,000h/year, save electricity directly:

功率 Power (Kw)	7.5	11	15	18.5	22	37	45	55	75	90	110	132	160	250
省电 Saving (Kw·h)	21000	30800	42000	51800	61600	103600	126000	154000	210000	252000	308000	369600	448000	700000



普通螺杆空压机可以通过外挂变频器的方式调节电机转速，从而调节排气量，使得产气量与用气量相适应，达到节能的效果。但是普通螺杆空压机所采用的电机都是额定转速、额定功率和额定效率，外挂变频器强行迫使空压机电机偏离额定转速。而普通电机一旦偏离额定转速，效率将大幅下降，偏离越多效率降幅越大。使用永磁变频电机的艾高永磁变频螺杆空压机在任何转速下，都能保持极高的电机效率，因而节能效果远优于外挂变频器的普通螺杆空压机。

此外，外挂变频器的普通螺杆空压机的调节范围为50-100%，也就是说当偏离工况50%以上时，外挂变频器将无法调节电机转速，而艾高永磁变频螺杆空压机调节范围为25-100%，也就是说艾高永磁变频螺杆空压机偏离工况75%时还能正常工作。

Common rotary screw air compressor may adjust rotating speed of the motor through the external transducer, so as to adjust the gas displacement, balance gas production rate and gas consumption and achieve the purpose of saving energy. However, the motor of common rotary screw air compressor is of rated speed, rated power and rated efficiency, and the external transducer forces the air compressor's motor to deviate from the rated speed. Once the common motor deviates from the rated speed, its efficiency will decrease largely; when the speed deviates largely, the efficiency will decrease accordingly. When ECOAIR permanent magnet variable speed rotary screw air compressor equipped with a permanent magnet variable speed motor runs at any speed, it can always keep very high motor efficiency, so its energy-saving efficiency is much higher than that of flexible rotary screw air compressor equipped with an external transducer.

In addition, adjustment range of the common rotary screw air compressor equipped with an external transducer is 50-100%; it means when it deviates over 50% of working condition, the external transducer can't adjust speed of the motor. In contrast, adjustment range of ECOAIR permanent magnet variable speed rotary screw air compressor is 25-100%; it means ECOAIR permanent magnet variable speed rotary screw air compressor can still work normally when it deviates 75% of working condition.



永磁变频 EPM 系列空压机技术参数 Permanent magnetic variable frequency EPM series air compressor technical parameters

项目 Project	型号 Model	Mpa	EPM15	EPM18	EPM22	EPM37	EPM45	EPM55	EPM75	EPM90	EPM110	EPM132	EPM160	EPM250
排气量/排气压力 (M³/min) Gas Displacement/Output Pressure	排量 m^3/min 压力 Mpa	2.95/7	3.6/7	3.86/7	6.8/7	8.2/7	16.9/7	14.3/7	16.8/7	23.6/7	25.6/7	29.3/7	43.1/8	45.2/7
		2.8/8	3.2/8	3.75/8	6.5/8	7.5/8	16.5/8	13.3/8	15.6/8	23.5/8	24.8/8	28.5/8	43.1/8	
环境温度 Environmental Temperature	°C	-5~+40°C												
冷却方式 Cooling Mode		风冷 Air Cooling												
排气温度 Exhaust Gas Temperature	°C	≤环境温度+10°C (Environment Temp+10°C, 风冷型 Air-Cooling)												
噪音 Noise	dB(A)	64±2	65±2	65±2	65±2	68±2	68±2	72±2	72±2	72±2	76±2	76±2	76±2	84±2
驱动方式 Drive Mode		永磁同步 Frequency synchronization												
电源 Power Supply	V/Ph/Hz	3/380/50												
功率 Power	KW	15	18.5	22	37	45	55	75	90	110	132	160	160	250
启动方式 Starting Mode		变频启动 Starter												
外形尺寸 Overall Dimension	长 Length	mm	1180	1300	1300	1440	1900	1900	1950	2280	2280	2300	2300	3200
	宽 Width	mm	790	900	900	990	1150	1150	1230	1320	1320	1360	1360	2100
	高 Height	mm	1175	1260	1260	1450	1690	1690	1980	1980	1980	1980	1980	2340
重量 Weight	kg	380	490	490	680	1120	1120	1350	2100	2290	2880	2980	4800	
出口管径 Outlet Pipe Diameter	inch	G 1"	G 1"	G 1"	G 1 1/2"	G 2"	G 2"	G 2"	G 2"	DN65	DN65	DN65	DN65	DN80



永磁变频 APM 系列空压机技术参数 Permanent magnetic variable frequency APM series air compressor technical parameters

项目 Project	型号 Model	Mpa	APM7	APM11	APM15	APM22	APM37	APM55	APM75
排气量/排气压力 (M³/min) Gas Displacement/Output Pressure	排量 m^3/min 压力 Mpa	1.20/7	1.66/7	2.99/7	3.86/7	6.8/7	10.9/7	14.3/7	14.3/7
		1.10/8	1.53/8	2.8/8	3.75/8	6.5/8	10.5/8	13.3/8	13.3/8
环境温度 Environmental Temperature	°C	-5~+40°C							
冷却方式 Cooling Mode		风冷 Air Cooling							
排气温度 Exhaust Gas Temperature	°C	≤环境温度+10°C (Environment Temp+10°C, 风冷型 Air-Cooling)							
噪音 Noise	dB(A)	63±2	63±2	64±2	65±2	65±2	68±2	72±2	72±2
驱动方式 Drive Mode		变频同步 Frequency synchronization							
电源 Power Supply	V/Ph/Hz	3/380/50							
功率 Power	KW	7.5	11	15	22	37	55	75	75
启动方式 Starting Mode		变频启动 Starter							
外形尺寸 Overall Dimension	长 Length	mm	680	880	1120	1200	1420	1760	1820
	宽 Width	mm	580	580	750	800	820	1100	1200
	高 Height	mm	690	860	1190	1220	1400	1460	1560
重量 Weight	kg	240	350	380	490	680	1200	1360	
出口管径 Outlet Pipe Diameter	inch	G 3/4"	G 3/4"	G 1"	G 1"	G 1 1/2"	G 2"	G 2"	