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上海祁立环保设备有限公司

Shanghai QILEE Environmental Protection Equipment Co., Ltd

100% 纯无油技术

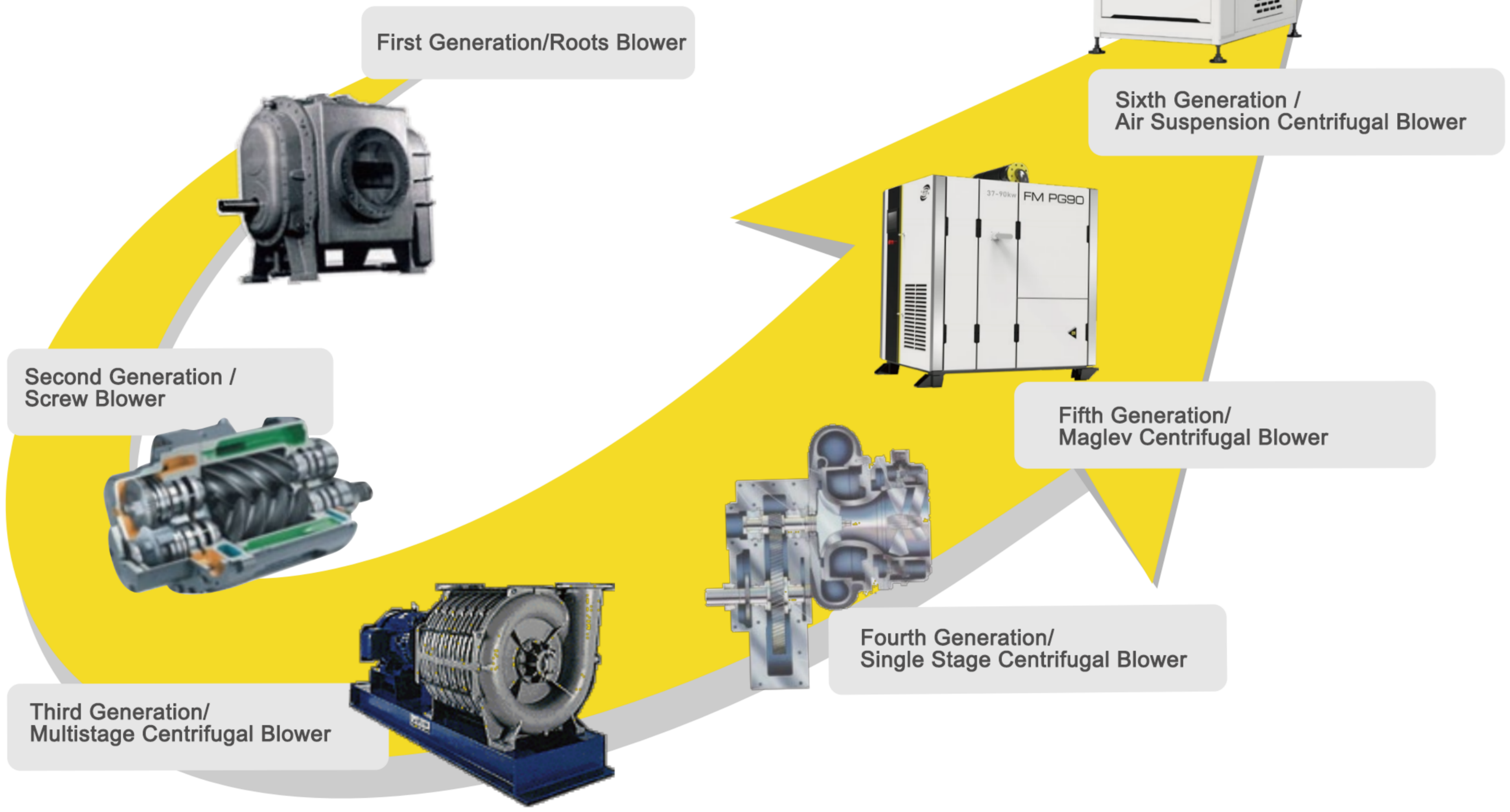
100% 免保养技术

50%~100% 永磁变频离心技术

03 Industry status

Blower Technology Innovation History

Traditional Roots blowers and centrifuges are being replaced by suspension centrifugal blowers, which are 100% oil-free, 100% friction-free, and 100% maintenance-free. Plan, using technology to help the country achieve the strategic goals of "carbon peak" and " carbon neutrality".



Performance comparison of various blowers

performance Comparison		Root Blower	Multistage Centrifugal Blower	Single Stage High Speed Blower	Flying Magnetic Air Suspension Fan	Flying Magnetic Levitation Fan
Bearing	Bearing Type	Ball Bearing	Ball Bearing	Tilting Pad Bearings	Foil Bearing	Magnetic Suspension Bearing
	Source Of Technology	Domestic	Domestic	Imported/Domestic	South Korea/ Aerospace Science and Industry	Independent Development/ U.S. Team Collaboration
	Service Life	1-2 years	2-3 years	3-5 years	Semi-Permanent	Semi-Permanent
Motor	Motor Type	Low Speed Asynchronous	Low Speed Asynchronous	Low Speed Asynchronous	Ultra-High Speed Permanent Magnet	High Speed Permanent Magnet
	Transmission Structure	Indirect Drive	Indirect Drive	Indirect Drive	Coaxial	Coaxial
	Motor Efficiency	88%	88%	94%	97%	96%
	Speed control	NO	NO	NO	Variable frequency speed regulation	Variable frequency speed regulation
	Operating Range	Very small	Very small	Narrow range	Large amplitude	Large amplitude
Impeller	Impeller type	Cast iron	Cast Aluminum	Aluminum Alloy ternary flow	Aluminum Alloy ternary flow	Aluminum Alloy ternary flow
	Operation Life	5-8years	10years	15years	20years	20years
	Impeller efficiency	LOW	LOW	Higher	HIGH	HIGH
Install	Foundation	Required	Required	Required	No	No
	Spreader	Required	Required	Required	No	No
Maintain	Lubricating oil	Lubricating Oil	Lubricating Oil	Lubricating Oil	Oil-free environmental protection	Oil-free environmental protection
	Wearing parts	Bearing, gear	Bearing, gear, lubricating oil pump	Bearing, gear, lubricating oil pump	Filter screen	Filter screen
	Fees	LOW	HIGH	HIGH	LOW	LOW
Noise		100-110dB	90-95dB	90-95dB	72-80dB	72-80dB
Operating Costs		Highest	Medium	Medium	Low	Low
After-sale Maintenance		Short cycle, high failure rate and high total cost	Long maintenance cycle, high cost, and difficult startup	Long maintenance cycle, high cost, and difficult startup	Independent core components, timely maintenance cost is low	Independent core components, timely maintenance cost is low

04 Solutions and products

Fan product lineup

Through cooperation with South Korea's air suspension research and development team and Japan's magnetic suspension research and development team, and mastering the air suspension and magnetic suspension technology at the same time, striving for perfection and continuous innovation, the sixth generation of "The world's top intelligent" air suspension centrifugal blower and magnetic suspension centrifugal blower have been launched.

Air Suspension Centrifugal Blower

Magnetic Suspension Centrifugal Blower

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Magnetic Blowers Five Advantages

High energy saving
Long service life

Direct drive of high-speed permanent magnet motor and high-efficiency three-way flow impeller can save more than 30% energy than traditional roots blower, more than 20% energy than multi-stage centrifugal blower, and more than 10% energy than single-stage centrifugal blower; The service life can be more than 20 years

Pure oil-free
Maintenance-free

After the fan is started, it operates without friction and does not need lubricating oil; Daily operation, free of mechanical maintenance, requires only regular replacement of the filtration system.

Intelligence
Variable frequency

The local system and remote monitoring system are adopted to monitor the operation status of the fan in real time and realize intelligent adjustment of air volume, air pressure, speed, etc. The permanent magnet frequency conversion range is 50% - 100%.

Low noise
Low vibration

With self-balancing technology, the vibration of the suspension bearing is one order of magnitude smaller than that of the traditional bearing and there is no friction. At the same time, the active damping design is adopted, and the operation is stable. The vibration intensity of the body is less than 2mm/S, and the average noise of the fan is less than 80dB, which meets the national environmental protection requirements.

Small size
Light weight
Easy to install

The integrated design is adopted, which is about 50% smaller than the traditional fan, small in size and light in weight, and convenient for transportation and installation.

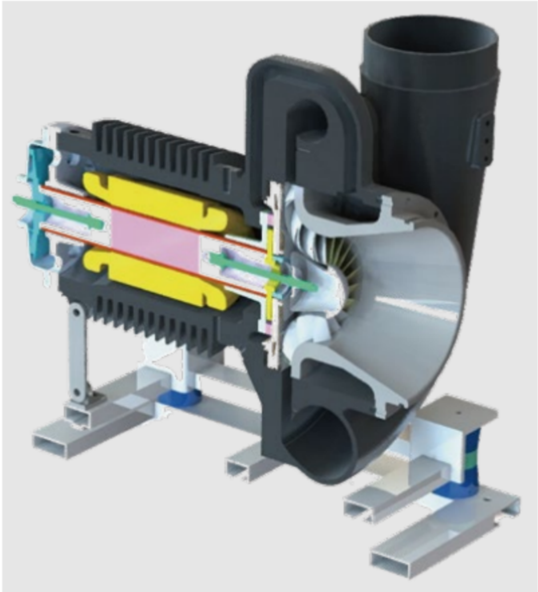
Technology

High Speed

High Yield

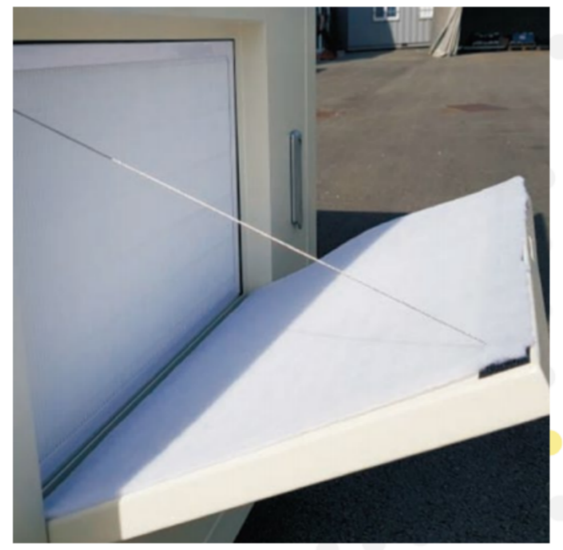
Overall structure of air suspension Blower

High speed permanent magnet synchronous motor



Up to 400,000RPM;
40,000 failure-free start and stop;
The motor efficiency can reach more than 97%;
Simple structure and small volume;
The motor is directly connected to the impeller without transmission loss.

Air inlet filter system



High temperature resistance: up to 60°C
Filter density: F8
Filtering accuracy: PM2.5
Filtering efficiency: above 90%
Replacement cycle: according to the system differential pressure reminder,
Regular replacement, convenient and safe

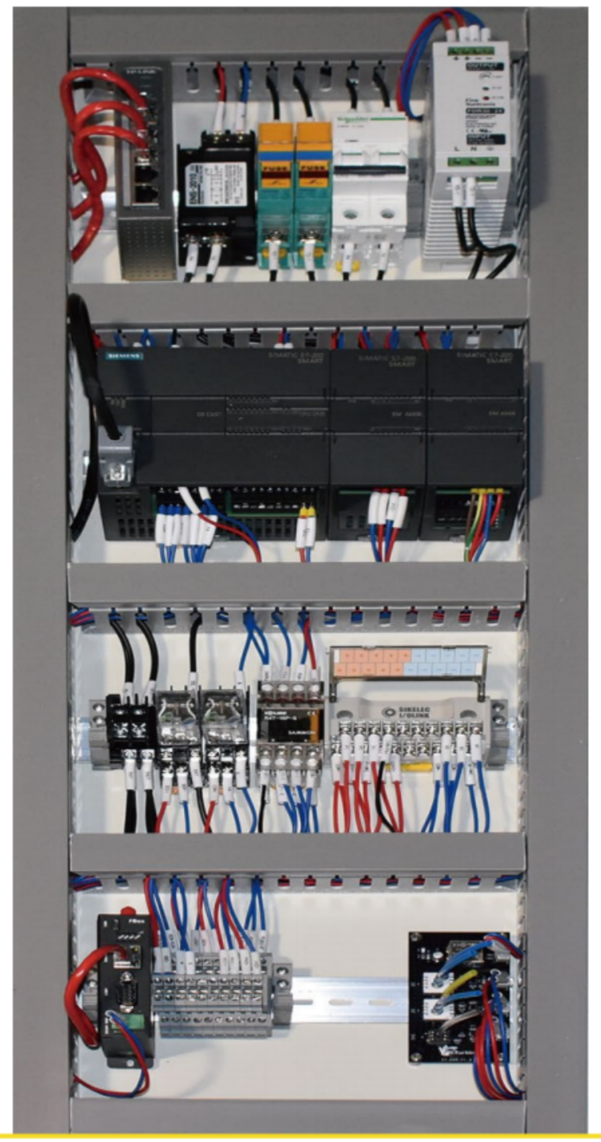
High speed variable frequency drive system

Special driving control algorithm for air suspension permanent magnet synchronous motor,
Make the motor run stably, and the power consumption is low; The starting current is small;
The frequency converter efficiency is more than 97%;
-20~55°C wide range operation; Accurate speed control.

Smart Touch color screen

Adjust the on-site touch screen and check the running status of the device;
It has a variety of anti-surge protection functions to ensure the safe operation of products;
Provides multiple operation modes to intelligently adjust pressure and flow;
Full lifecycle data storage; Supports multiple communication protocols;
Intelligent cloud system, early warning operation status;
Linkage operation monitoring; Operation environment monitoring.

Siemens S7-PLC control system



Constant speed mode
Constant current mode
Dissolved oxygen mode
Constant pressure mode
Constant traffic mode

Introduction to core technology of air suspension motor

Customized efficient winding design

Direct connection technology of ultra-high speed permanent magnet synchronous motor

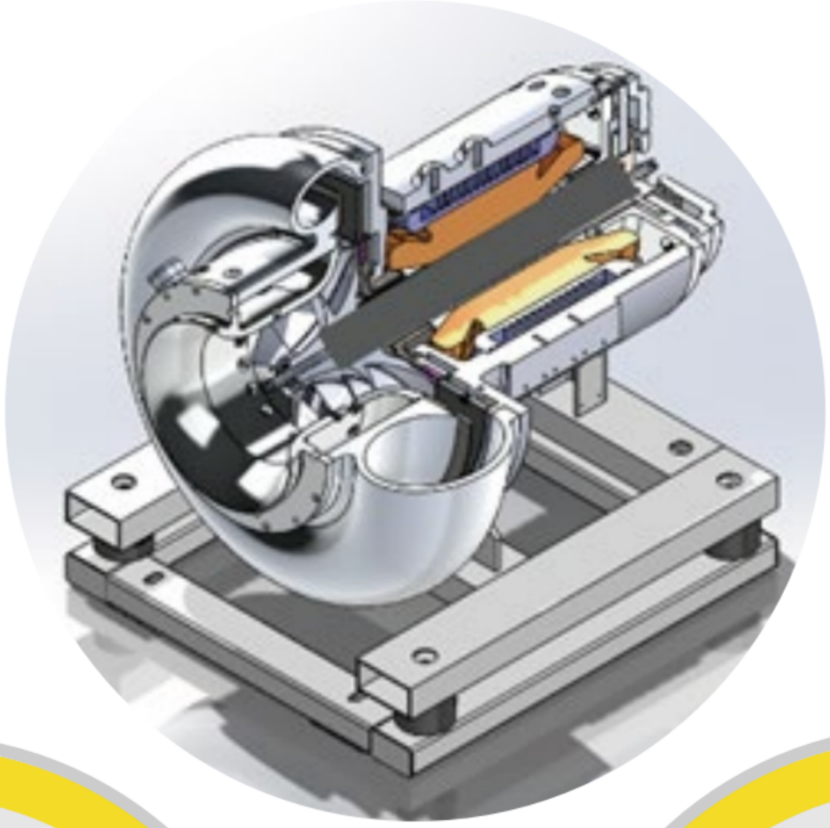
Up to 400,000RPM;

40,000 failure-free start and stop;

The motor efficiency can reach more than 97%;

Simple structure and small volume;

The motor is directly connected to the impeller without transmission loss.



Aviation ternary flow impeller

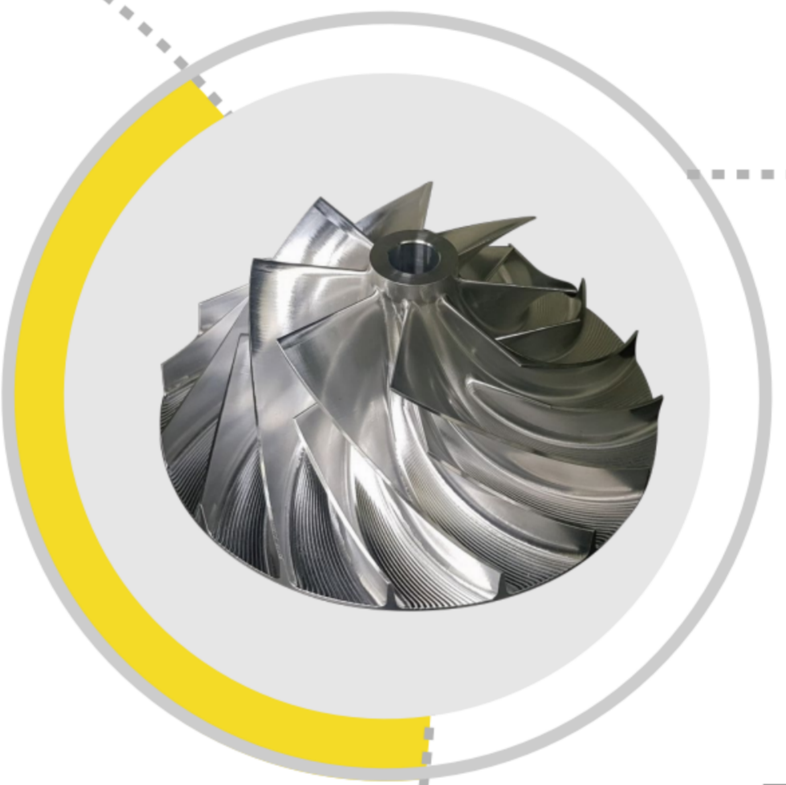
Full ternary flow rear bending pneumatic design with high efficiency and wide working range;

Five-axis linkage high-speed milling and molding, the manufacturing accuracy can reach um level

Using high-strength aviation aluminum material, the surface is subjected to hard anodic oxidation,

High strength, good corrosion resistance and service life of more than 20 years

According to the actual needs of users, special high-efficiency impellers can be designed to pursue the best energy-saving effect.



Air suspension bearing technology

After starting the instantaneous friction of the top foil, the gas film is formed to suspend, and the operation is stable;

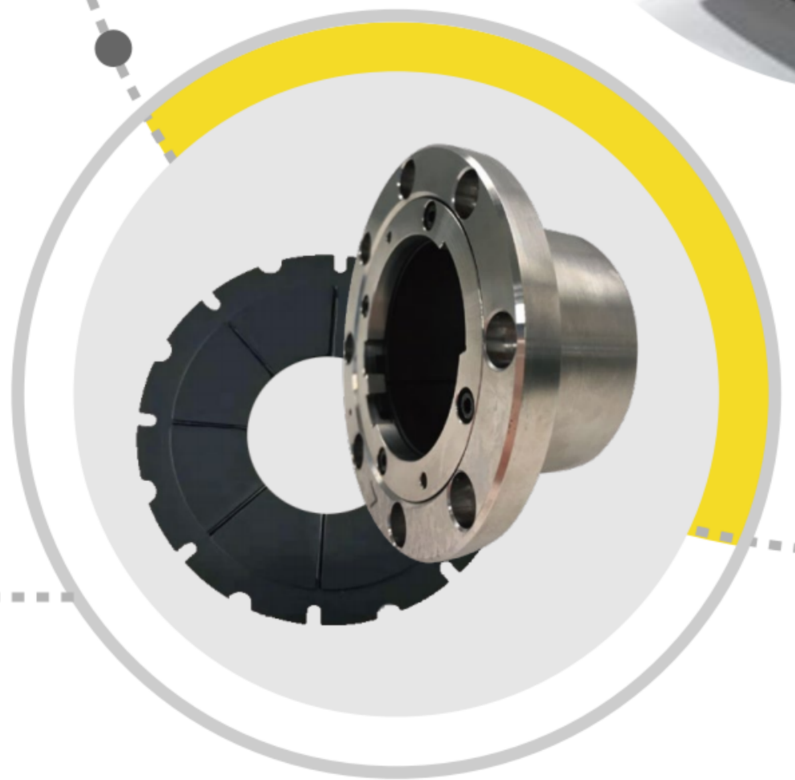
High running speed, maximum rotation speed 1,000,00rpm;

No fever phenomenon;

Suitable for a large temperature range of -180~600°C;

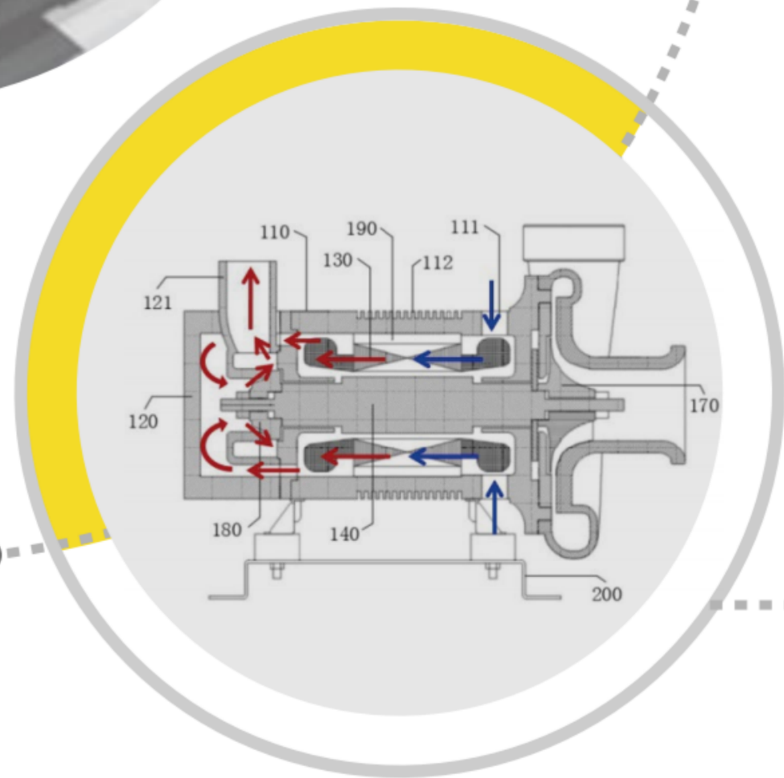
No oil, no pollution to the environment;

Maintenance-free.



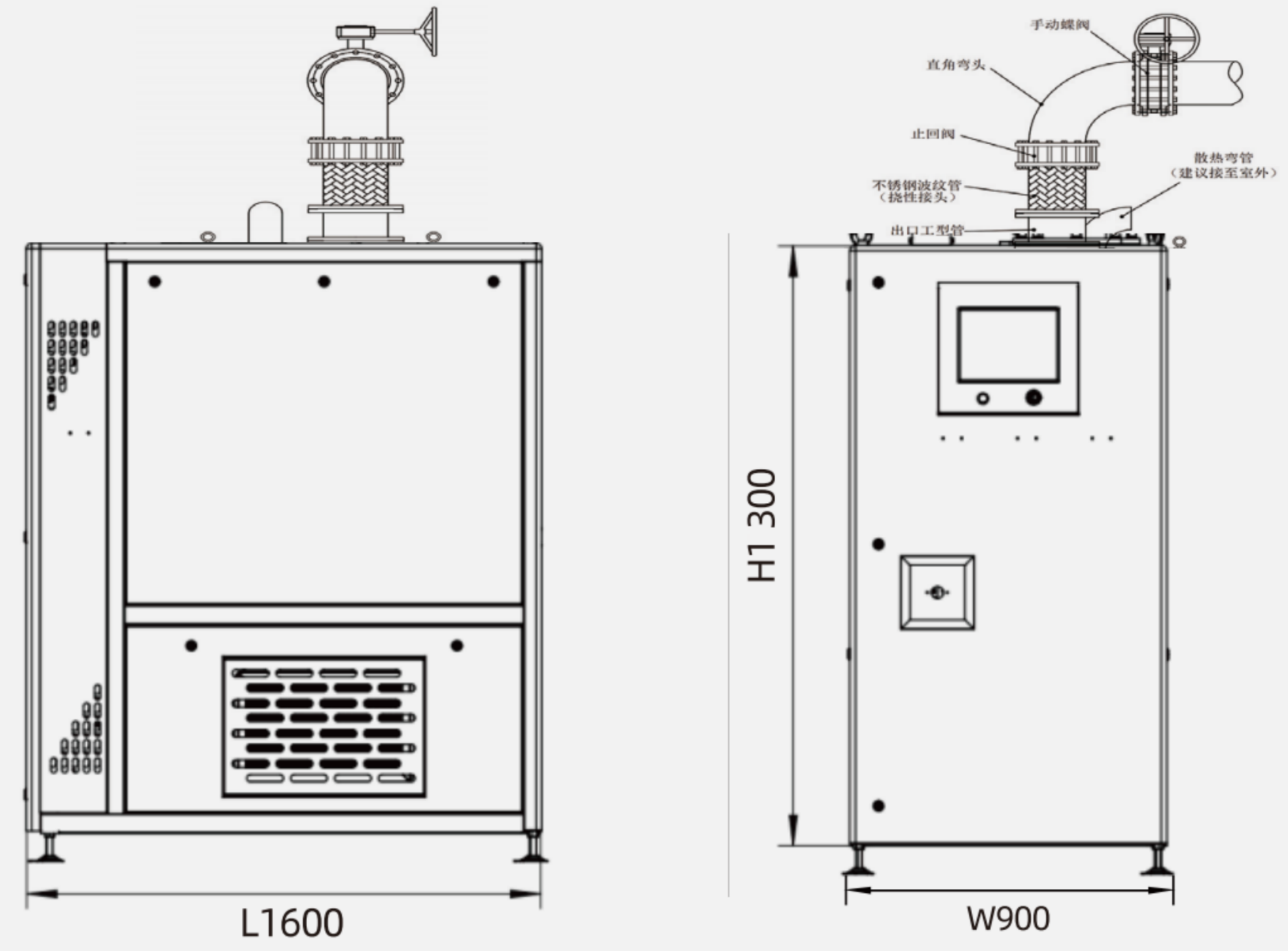
Efficient and energy-saving air cooling system

It adopts direct-connection self-driving air cooling system, with smooth heat dissipation, high efficiency and energy saving.

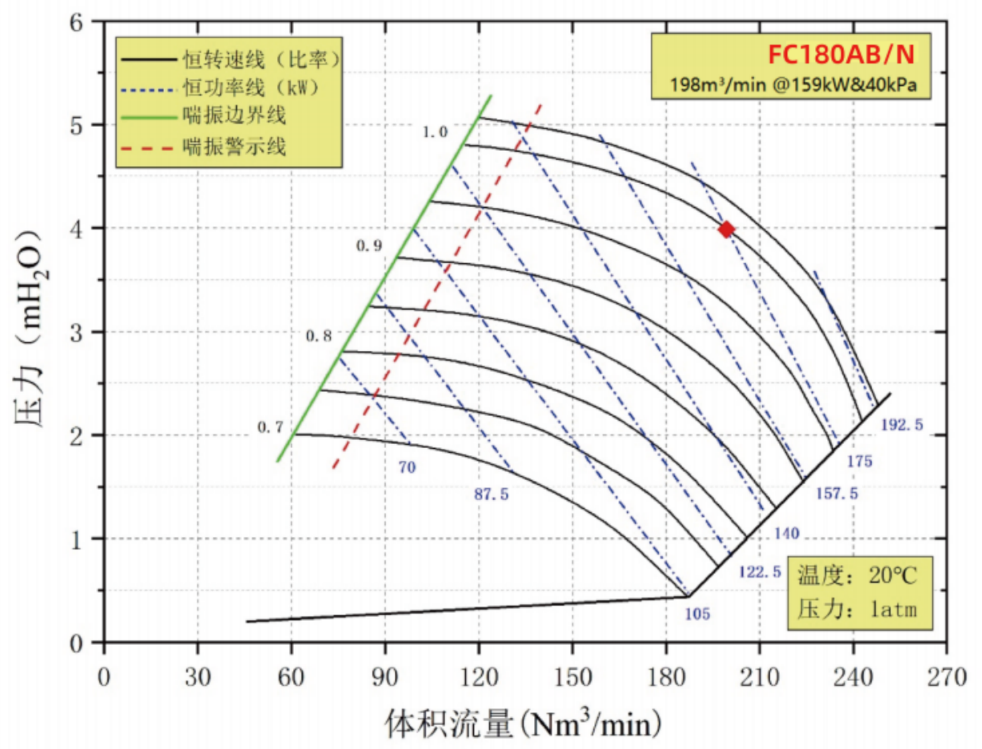


Manufacturing Inspection process

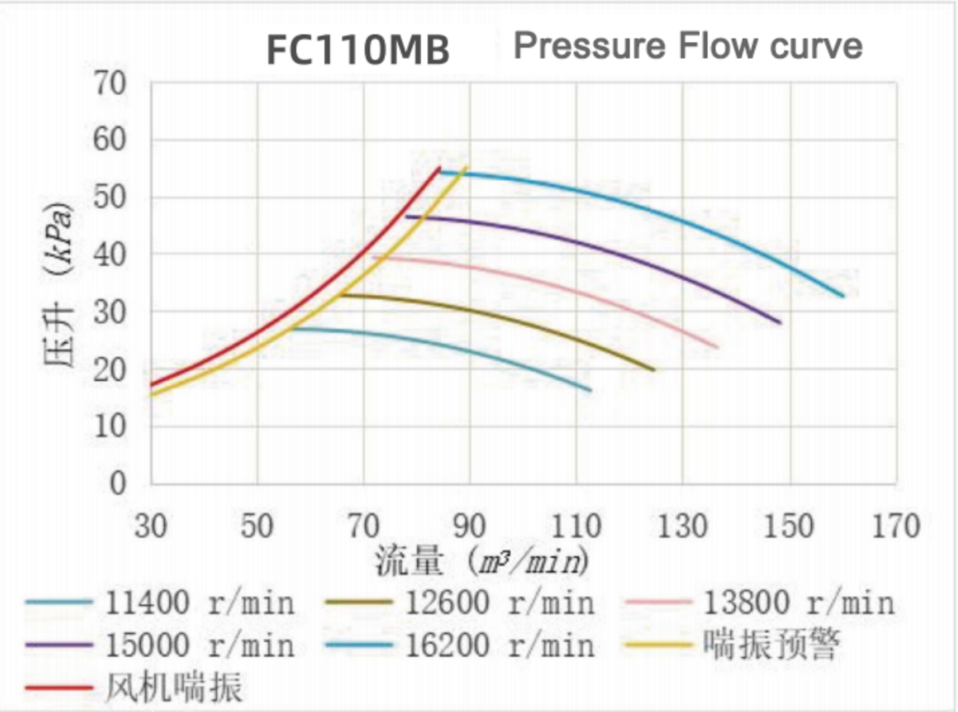
Installation diagram



Performance Curve diagram



Air suspension centrifugal blower



Magnetic levitation centrifugal blower

Overall structure of magnetic levitation blower

Magnetic levitation centrifugal blower is a kind of blower that uses magnetic suspension force to support high-speed rotation of spindle without friction,! It is characterized by high mechanical efficiency, energy saving and low noise. It is widely used in various industrial occasions and its products have the following core technical advantages:a

Magnetic levitation control system

Unique Intelligent electromagnetic bearing technology through closed-loop control

And PID plus active damping and unbalance compensation control,

Reduce the vibration caused by the unbalance of rotor rotation.a

Intelligent operation interface

Intelligent control technology

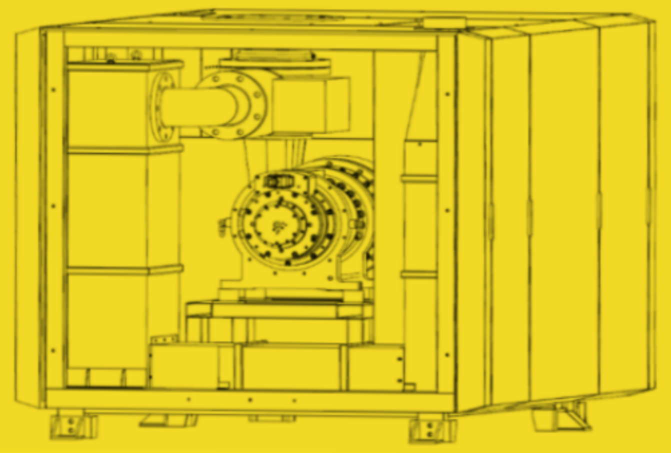
Real-time display of working conditions and real-time adjustment of air volume,

Adjustment range: 50%-100%,

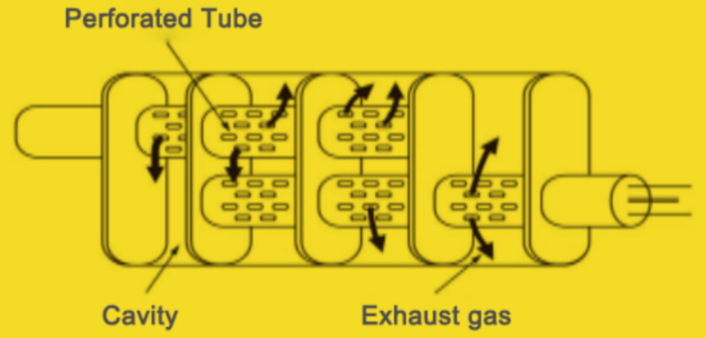
Automatic anti-surge design,

Local and remote dual control and dual diagnosis.

Design of ultra-quiet complete machine



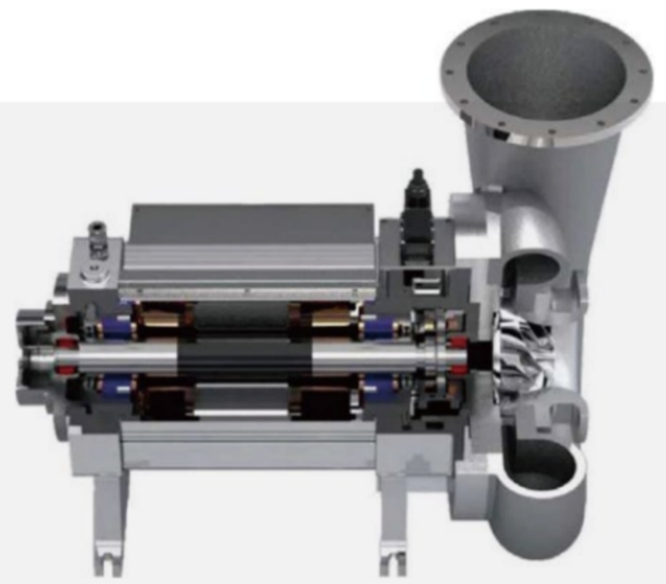
Compound silencing technology



Special muffler

According to the requirements of national environmental protection on noise index, the structure of the inlet and outlet air duct of the blower is optimized to effectively reduce the wind noise: Meanwhile, the developed special muffler combines the noise characteristics of the high-pressure blower to strengthen the noise absorption capacity of the blower cabinet. The experimental data show that the controllable range of noise of the whole machine is 70-75dB, exceeding the first-class level in the industry.

High speed permanent magnet suspension motor technology



Active magnetic suspension bearing (AMB)

No gear box, no oil lubrication system

Three-way flow high-efficiency impeller direct connection

The rotor is supported and operated by magnetic suspension bearings without friction and vibration.

The rotating speed of the composite rotor is nearly 20 times higher than that of the conventional motor.

High-speed passive safe cooling design maximum speed 100000 rpm

High frequency variable speed drive technology

Inverter efficiency reaches 97.5%

Matching with high-speed motor to replace gear box

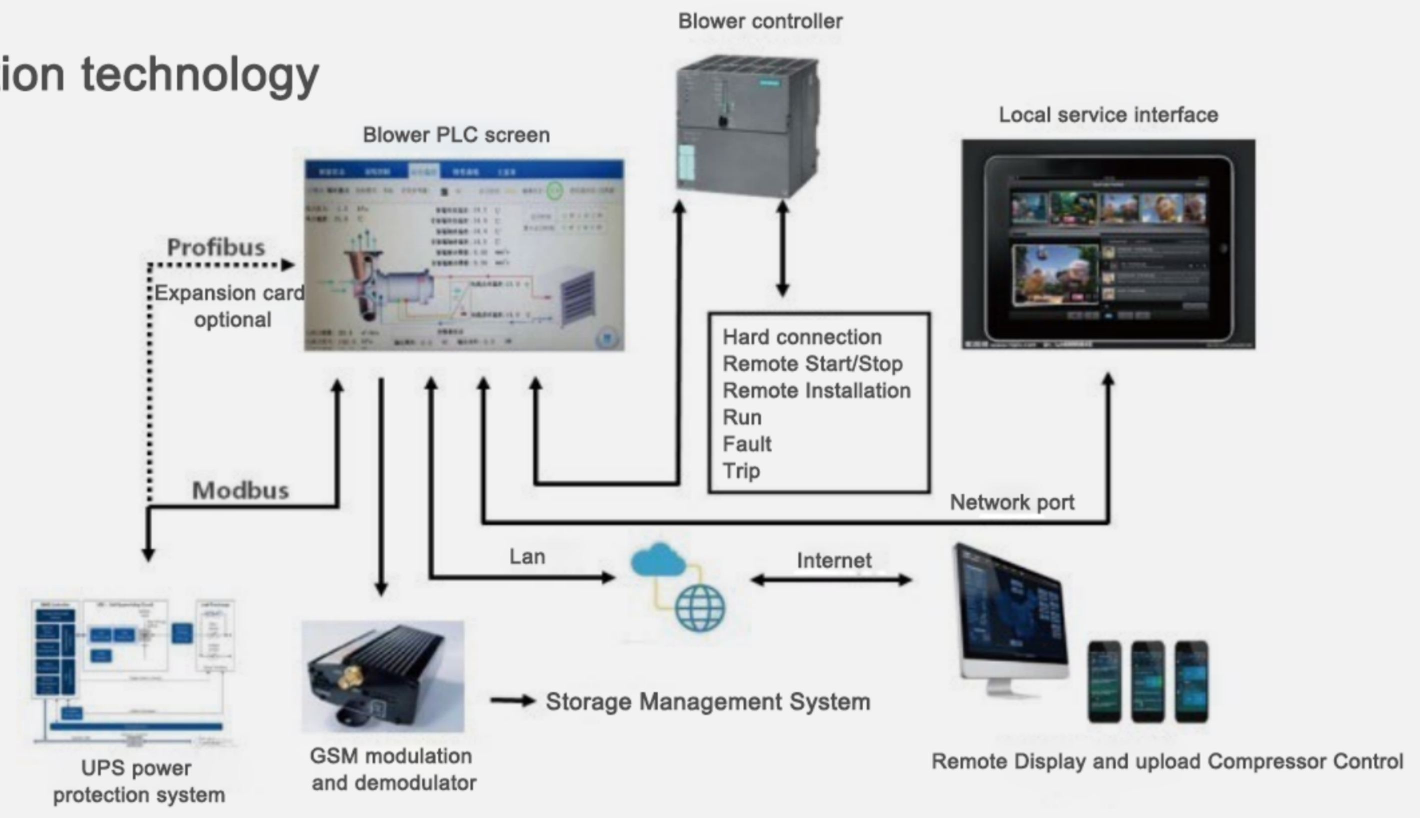
Using common pulse width modulation (PWM) control

Operating range in 50Hz power grid environment 0-2000Hz

Mature technical verification, stable and reliable quality

Optimal energy-saving operation according to working conditions

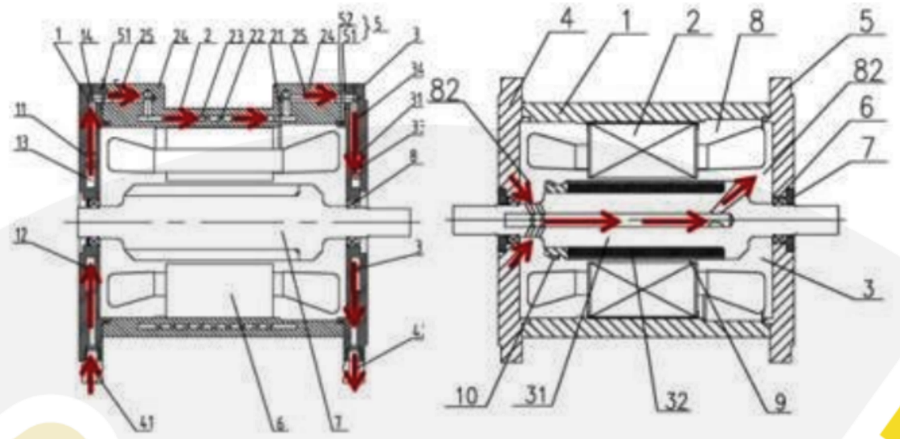
5G remote interconnection technology



Introduction to core technology of magnetic levitation motor

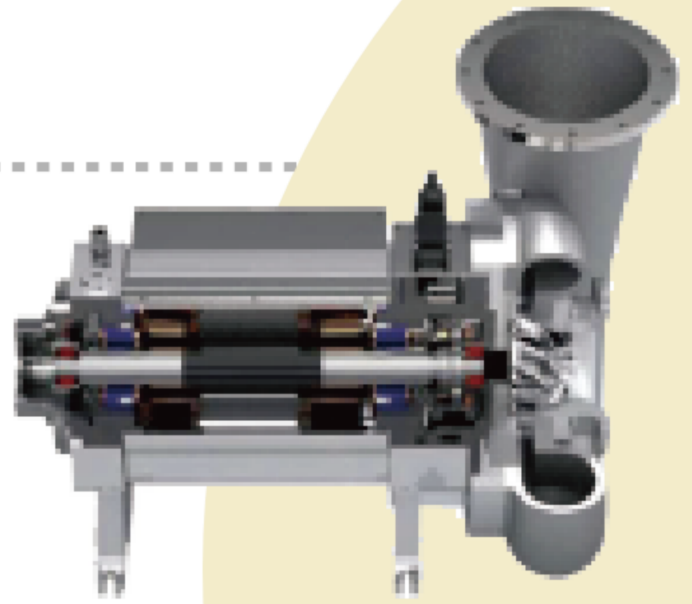
Efficient and energy-saving air cooling system

Closed self-circulation cooling system, smooth heat dissipation, high efficiency and energy saving



Magnetic levitation motor

Up to 100,000RPM;
No limit on the number of starts and stops;
The motor efficiency can reach more than 97%;
Simple structure and small volume;
The motor is directly connected to the impeller without transmission loss.a



Three-way flow impeller

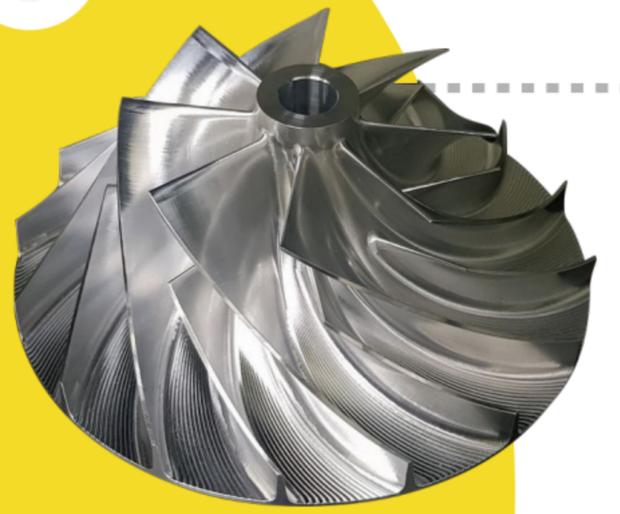
Use high hardness heat treatment aviation aluminum AL7075 (aviation aluminum)

It is precisely manufactured by a 5-axis machining center, and the tolerance is kept below 0.01mm.

The surface is smooth and clean, and the efficiency is higher than that of casting impeller.

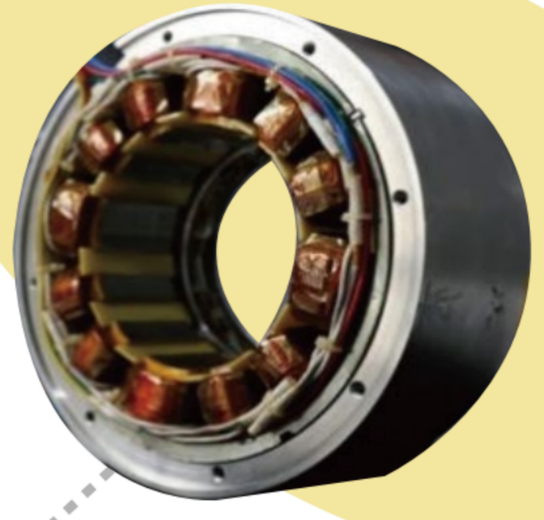
High strength, suitable for harsh working conditions of high temperature and high pressure

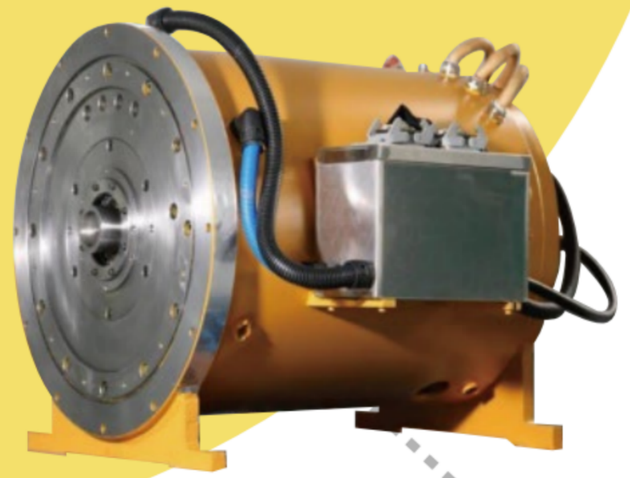
Because the impeller is directly connected to the shaft, there is no transmission loss.



Magnetic suspension bearing technology

No friction, stable operation, no crawling phenomenon;
High running speed, maximum rotation speed 1,000,00rpm;
No fever phenomenon;
Suitable for a large temperature range of -180~600°C;
Pure Oil-free and pollution-free to the environment;
Maintenance-free.





Safety Design power-off protection

Uninterruptible power protection
Use imported brand protection power supply, within 4ms of accidental power failure
Secondary power supply for the magnetic bearing to ensure the power-off operation of the magnetic bearing
Linkage control and automatic protection
Linkage with inverter protection, slow down and stop at the moment of power failure to ensure the protection of bearings
Auxiliary mechanical bearing protection
The auxiliary mechanical bearing adopts imported customized products, and has been verified by dozens of instantaneous drop tests, ensuring the safety of motor rotor and magnetic bearing drop, and realizing convenient replacement of auxiliary bearing.

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Air suspension centrifugal blower selection table

Parameter/model		FC15AB	FC20AB	FC30AB	FC40AB	FC50AB	FC75AB	FC90AB	FC100AB	FC125AB	FC150AB	FC170AB	FC180AB	FC200AB	FC215AB	FC250AB	FC300AB	FC350AB	FC400AB
Outlet pressure (kPa)	Pressure	风量（m³/min）																	
	40	14	18	28	38	48	75	80	94	120	147	168	162	190	198	215	270	345	403
	50	11	15	24	33	40	59	69	76	95	116	129	140	155	172	192	245	275	330
	60	9	13	20	28	35	54	64	70	86	105	110	126	140	147	167	210	236	283
	70		11	19	25	32	46	55	64	78	93	106	112	122	130	149	189	207	248
	80			18	22	28	42	50	55	70	86	98	104	110	120	130	168	185	222
	90				19	24	37	44	50	62	70	79	94	95	107	120	151	168	202
	100					22	34	40	45	56	65	74	86	88	100	112	141	155	185
	110						31	37	42	46	63	71	79	82	91	101	134	143	172
	120						29	34	39	43	56	67	74	77	83	94	125	134	160
Shaft power	KW	12	15	22.5	30	37.5	55	68	75	92	112.5	128	136	147	159	183	225	257	300
Overall Power	KW	12.5	17.5	27	35	42	64	75	80	98	119	136	150	162	175	200	250	280	330
Export caliber (DN)		DN100	DN150				DN200			DN250		DN300		DN350			DN400		
Number of filters (pieces)		2	3				6				8		12				14		
Weight (KG)		220	330	340	350	380	680	730	750	800	850	940	1000	1200	1300	1400	1680	1780	1950
Noise(decibel)		75 ±2	78 ±3																
Machine appearance size	L	1000	1200				1600		1700		1900			2000			2100		2900
	W	600	700				900		1000		1200			1400			1500		1700
	H	800	1100				1300		1400		1700			1900			2000		2100
Weight (KG)		220	330	350	380	650	690	750	800	850	950	1000	1300	1400	1700	1780	1680	1780	1950

* 1.1atm,20℃，65%RH，Density=1.2kg/m³.

2. According to the actual situation of the customer's site, the error range is + 5%. If there is any change in the above data, no further notice will be given. For specific type selection, you can communicate with the manufacturer for consultation.

Selection table of magnetic levitation centrifugal blower

Parameter/model		FC37MB	FC55MB	FC75MB	FC90MB	FC110MB	FC130MB	FC150MB	FC180MB	FC200MB	FC220MB	FC250MB	FC300MB	FC350MB
Outlet pressure (kPa)	Pressure	Air volume（m³/min）												
	30	56	83	113	135									
	40	46	68	93	112	132	156	180						
	50	35	52	71	85	116	137	158						
	60	32	48	65	78	96	113	130	156	173	190	217	260	303
	70	27	40	54	65	86	102	118	141	157	173	196	235	274
	80	25	37	51	61	74	87	100	120	133	146	167	200	233
	90					69	82	95	114	127	140	158	190	222
	100					63	74	85	102	113	124	142	170	198
	110					60	71	82	98	109	120	136	164	191
	120					55	65	75	90	100	110	125	150	175
Motor Power	KW	37	55	75	90	110	130	150	180	200	220	250	300	350
Export caliber (DN)	以70kpa	125/150	150/200	150/200	200	200/250	200/250	200/250	200/250	200/250	200/250	250	250/300	300
Number of filters (layer)		2/3	2/3	2/3	2/3	2/3	2/3	2/3	2/3	2/3	2/3	2/3	2/3	2/3
Noise (decibel)		<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Size	L	1730	1730	1730	1730	2380	2380	2380	2380	2380	2860	2860	2860	2860
	W	1519	1519	1519	1519	1555	1555	1555	1555	1555	1775	1775	1775	1775
	H	1972	1972	1972	1972	1762	1762	1762	1762	1762	1762.5	1762.5	1762.5	1762.5
Overall weight (KG)		1100	1100	1100	1100	1600	1600	1600	1600	1600	2600	2600	2600	2600
Cable Specifications (mm^2)		3*50+1*25			3*70+1*35	3*150+1*70					2*(3*120+1*70)		2*(3*150+1*70)	2*(3*185+1*95)

* （StandardConditions）：1atm，20℃，65%RH，Density=1.2kg/m3，Tolerance=±5%

Magnetic levitation centrifugal compressor selection table

Parameter/model	FC150MH	FC200MH	FC250MH	FC300MH	FC400MH	FC500MH
KW	110	150	185	220	300	350
Pressure Bar	Flow rate (m3/min): 1atm,20C, humidity 65%					
2	42	54	66	80	105	120
2.2	41	52	64	78	102	118
2.5	40	50	62	77	99	116
3	35	47	57	70	93	100
3.5	33	44	54	65	88	95

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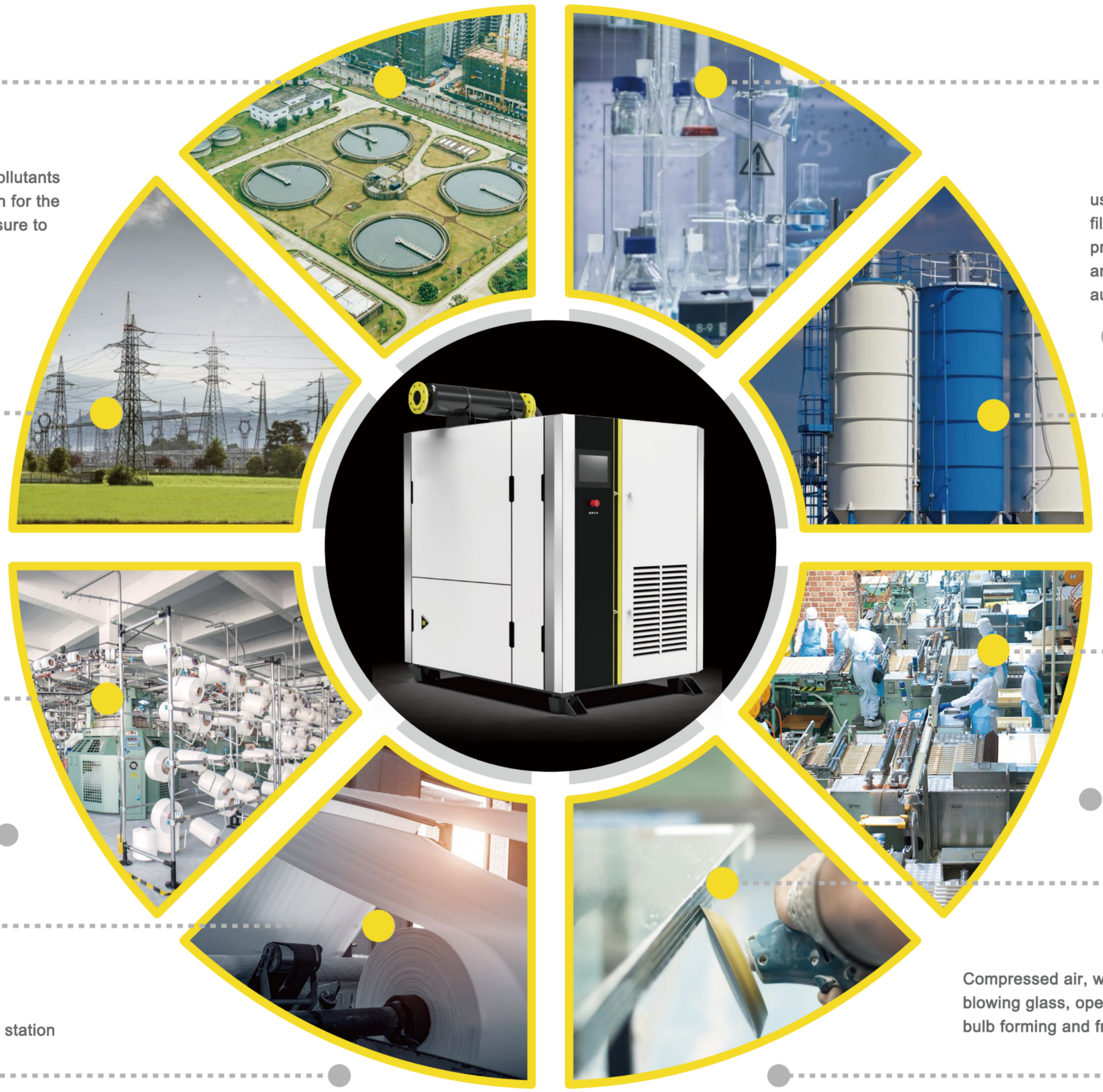
Industry Applications



1. Sewage treatment industry

It is used in the aeration tank to oxidize and decompose organic pollutants through aerobic microorganisms to provide sufficient dissolved oxygen for the aeration tank. At the same time, it uses wind pressure of certain pressure to blow/stir/blow away the target object.

2. Biopharmaceutical industry

In pharmaceutical factories, suspended centrifugal blowers are mainly used in filling machines in liquid preparations, granulators, pulping machines, filling machines, packaging machines and printing machines in solid preparations, and extraction tanks in extraction processes. In addition, there are test gas material transportation, drying, purging, pneumatic instrument, automatic control gas, etc.

3. Power Generation Industry

Oxidation desulfurization, used in slurry pool, uses oxygen in the air to provide sufficient dissolved oxygen for the working face.

4. Cement Transportation Industry

Kiln head kiln wake/homogenization process, pneumatic conveying, used for workshop pneumatic conveying, blowing lime powder, mineral powder, pulverized coal, etc.

5. Textile printing and dyeing industry

It is used in the bomb factory and plays the role of blowing wires and adding bombs.

6. Food brewing industry

Used in fermentation tanks, providing clean and oil-free air and food packaging.

7. Paper printing industry

Used for pulp blowing cooling and sewage treatment in sewage station

8. Glass Manufacturing Industry

Compressed air, which provides gas, is used in processes including processing glass sand, blowing glass, operating casting and pressing tools, supplying fuel furnace, glass etching, bulb forming and frosting.