湖南凌翔磁浮科技有限责任公司
HUNAN LINGXIANG MAGLEV TECHNOLOGY CO.,LTD.

中国　长沙　0731-85588103
网址：www.lxmaglev.com

2024.10.第四版(Fourth edition)

凌翔磁浮
LING XIANG MAGLEV

磁悬浮离心式鼓风机样册

MAGLEV TUBRO BLOWER

凌翔磁悬浮鼓风机 源自磁浮交通可靠性保证

LINGXIANG MAGLEV BLOWER DERIVED FROM THE RELIABILITY OF MAGLEV TRANSPORTATION

CONTENTS
目录

01. 公司简介

COMPANY PROFILE

湖南凌翔磁浮科技有限责任公司，专注于磁悬浮技术研发及应用的国家高新技术企业和国家级“专精特新”小巨人企业，连续入选“中国隐形独角兽500强”榜单，入选湖南省高新技术企业综合创新能力100强，建有湖南省“磁浮交通关键装备”工程技术研究中心、湖南省企业技术中心和“装备智能检测与自主可控技术”研究生创新实践基地，拥有由多名博士、硕士和行业资深专家组成的研发团队，精通磁悬浮技术的最新动态和趋势，持续不断地进行技术创新和产品优化。

Hunan Lingxiang Maglev Technology Co., Ltd. is a national high-tech enterprise specializing in the research and application of maglev technology. It is also recognized as a national-level Little Giant enterprise. Consistently ranked in the China Top 500 Hidden Unicorn list, the company is also among the Top 100 High-Tech Enterprises in Hunan Province for Comprehensive Innovation Capabilities. It houses the Hunan Provincial Maglev Transportation Key Equipment Engineering Technology R&D Center, the Hunan Provincial Enterprise Technology Center, and a graduate innovation practice base for Intelligent Equipment Inspection and Independent Control Technology. The company boasts a research and development team composed of several doctoral, master's degree holders, and industry veteran experts who are well-versed in the latest advancements and trends in levitation technology. Continuous efforts are made in technical innovation and product optimization.

02. 产品概述 PRODUCT INTRODUCTION

产品简介 PRODUCT INTRODUCTION

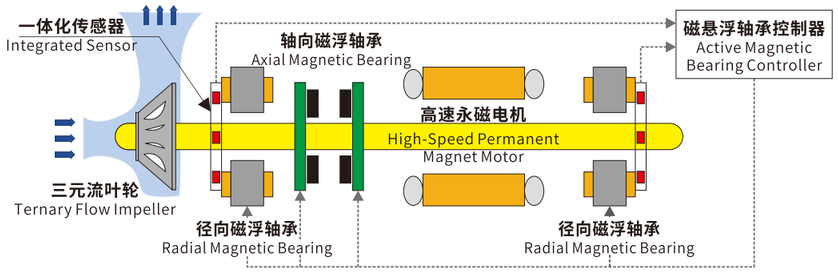
磁悬浮离心式鼓风机采用磁悬浮技术，将离心叶轮和磁悬浮高速电机一体化集成设计，极大地提高了设备工作效率，与传统风机相比节能20~30%，同时具备**无需润滑、无污染、免维护**等优点，是工业节能改造和节能投资的首选产品之一

The maglev turbo blower utilizes magnetic levitation technology, integrating the centrifugal impeller and the high-speed maglev motor into a unified design, significantly improving operational efficiency. Compared to traditional blowers, it offers 20-30% energy savings, along with advantages such as no lubrication, no pollution, and maintenance-free operation. It is one of the top choices for industrial energy-saving retrofits and investments.

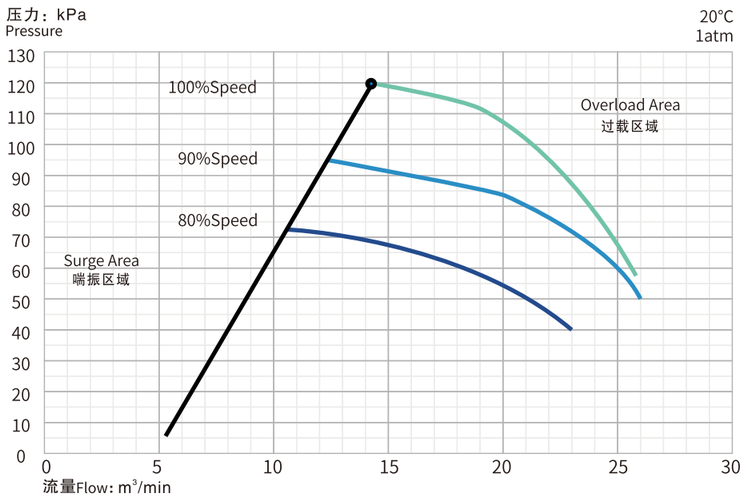
工作原理 OPERATION PRINCIPLE

磁悬浮轴承通电后，电磁力将电机转子悬浮，永磁电机产生的电磁力矩驱动电机转子在悬浮状态下高速旋转，通过磁悬浮轴承控制器精确控制电机转子跟轴承壁0.3~0.5mm微距而不发生摩擦……，电机转子直联三元流叶轮带动气体高速旋转，高速气流经叶轮出口扩压器将动能转化为气体压力，从而获得高压、高流量、高效率的气体……

After the magnetic bearings are powered on, the electromagnetic force suspends the motor rotor. The electromagnetic torgue generated by the permanent magnet motor drives the motor rotor to rotate at high speed in a suspended state. The active magnetic bearing controller precisely controls the motor rotor to maintain a micro-distance of 0.3-0.5mm from the bearing wall without friction. The motor rotor is directly connected to the ternary flow impeller to drive the gas to rotate at high speed. The high-speed airflow passes through the impeller outlet diffuser to convert kinetic energy into gas pressure, thereby obtaining high-pressure, high-flow, and high-efficiency gas.



LL-B37 性能曲线 LL-B37 PERFORMANCE CURVE



LL-B37

01 控制面板
Control Panel

02 变频器
Variable Frequency Drive (VFD)

03 主电源空气开关
Main Power Circuit Breaker

04 电机散热口
Motor Cooling Vent

05 电动旁通阀
Electric Bypass Valve

06 电源接线盖板（内含接线端子）
Power Connection Cover Plate
(includes terminal blocks)

07 磁悬浮高速电机
Maglev High-speed Motor

08 磁悬浮轴承控制器
Active Magnetic Bearing Controller

09 DC电源
DC Power Supply

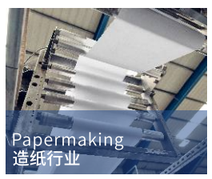
10 UPS电源
Uninterruptible Power Supply

11 变压器
Transformer

应用领域 APPLICATION AREAS

广泛应用于市政污水、化工、纺织印染、造纸、食品、医药、半导体、钢铁冶金等行业，选择我们，选择专业与品质，选择绿色未来

Linglong maglev turbo blowers are widely used in various industries, including:Municipal wastewater treatment, Chemical processing, Textile dyeing, Papermaking, Food processing, Pharmaceuticals, Semiconductors, Steel metallurgy...Choosing us means choosing professionalism and quality, and choose a green future.



03. 核心技术

CORE TECHNOLOGY

磁浮轴承系统 MAGLEV BEARING SYSTEM

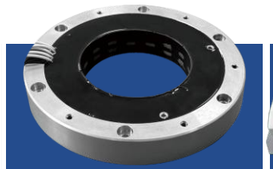
含磁悬浮轴承、控制器、一体化传感器

Including magnetic bearings, controller, and integrated sensors

- 采用凌翔自主研发五自由度磁浮轴承控制技术，智能控制转子位置
  Adopt Lingxiang's independently developed five-degree-of-freedom magnetic bearing control technology to intelligently control the rotor position.
- 采用自主研发一体化传感器，每秒数据采样频率≥15000次，保证高速转子稳定悬浮
  Adopt independently developed integrated sensors. The data sampling frequency per second is ≥15,000 times to ensure the stable suspension of the high-speed rotor.
- 无机械摩擦，无需润滑油，低功耗，长寿命
  No mechanical friction, no lubrication required, low power consumption, and long lifespan.
- 磁浮轴承功耗仅为传统滑动/滚动轴承的1/20
  The power consumption of maglev bearings is only 1/20 that of traditional sliding/rolling bearings

径向磁浮轴承
Radial Magnetic Bearing

轴向磁浮轴承
Axial Magnetic Bearing



一体化传感器
Integrated Sensor

磁浮轴承控制器
Active Magnetic Bearing Controller

磁悬浮离心式鼓风机
Maglev Turbo Blower

磁悬浮高速电机 Maglev High-speed Motor

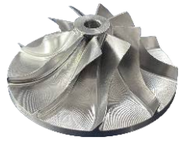
- 自主研发的磁悬浮高速电机采用紧凑型定子与稀土永磁体励磁转子，经115%超速试验，保证转子高速可靠运行
  The independently developed maglev high-speed motor adopts a compact stator and a rare earth permanent magnet excited rotor. After a 115% overspeed test, it ensures the high-speed and reliable operation of the rotor.
- 功率密度高，体积小，重量轻，寿命超过20年
  High power density, small size, lightweight, and a lifespan of over 20 years.
- 最高转速超52000rpm；无机械摩擦，运行效率高，电机效率经第三方检测达97%
  The maximum speed exceeds 52,000 rpm; without mechanical friction, the operating efficiency is high, and third-party testing has confirmed a motor efficiency of 97%.

立式
Vertical

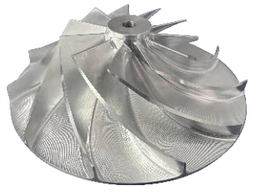
卧式
Horizontal

叶轮 IMPELLER

- 采用全可控涡任意扭曲三元流叶轮设计，叶轮效率更高，工作范围更广
  Uses a fully controllable vortex with an arbitrarily twisted tri-foil flow design, resulting in higher impeller efficiency and a broader operating range.
- 采用高强度航空铝材料，五轴加工中心一体铣削成型，抗变形能力强
  Made from high-strength aerospace aluminum, precision-machined using a five-axis milling center, offering strong resistance to deformation.
- 叶轮表面防腐处理，提高叶轮耐腐蚀性、耐磨性
  The impeller surface undergoes anti-corrosion treatment to enhance its resistance to corrosion and wear.
- 材料通过100%探伤检测，加工完成后经过115%超速试验，动平衡精度达到G0.4，保证叶轮安全运行
  The material used for manufacturing the impeller undergoes 100% non-destructive testing, and after processing, the impeller is subjected to a 115% overspeed test with a dynamic balance accuracy of G0.4 to ensure safe operation.



散热端叶轮
Cooling End Impeller



负载端叶轮
Load End Impeller

变频器 VARIABLE FREQUENCY DRIVE (VFD)

- 特定开发高频矢量变频器，高频输出不降容，适应各种恶劣运行环境
  Specially developed high-frequency vector frequency converter. The high-frequency output does not reduce capacity and is suitable for various harsh operating environments.
- 高性能矢量控制技术，参数适应性好，控制性能高，输出谐波低，电机发热小
  High-performance vector control technology with excellent parameter adaptability, superior control performance, low output harmonics, and minimal motor heating.

Lingxiang Maglev 凌 翔 磁 浮

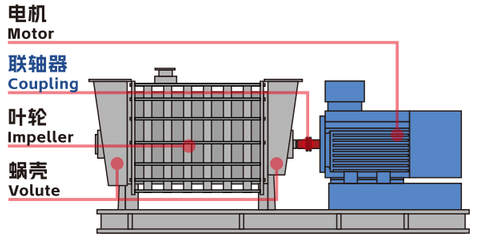
磁悬浮离心式鼓风机
Maglev Turbo Blower

磁悬浮离心式鼓风机
Maglev Turbo Blower

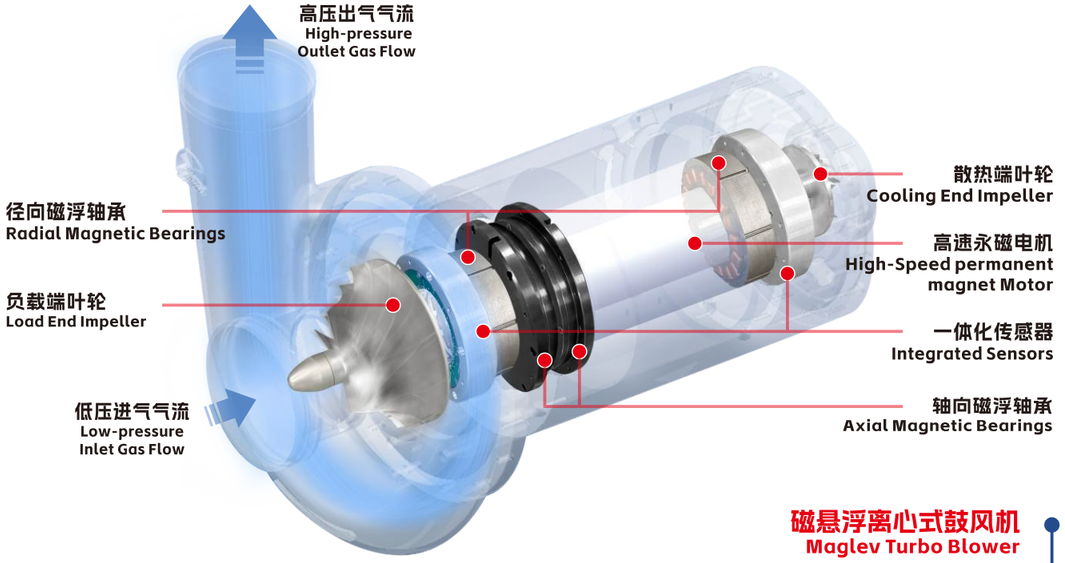
04.
结构对比 STRUCTRAL COMPARISON

多级离心鼓风机是一种速度型鼓风机，工作原理是靠离心力的作用，提高气体流速与输出压力，因受机械轴承温升及变形限制，电机无法实现高转速运转，通过采用多级压缩的方式获得较高的气体输出压力，存在**设备结构复杂、运行效率相对较低**等问题。

The multistage centrifugal blower is a velocity-type blower. The working principle is to rely on the action of centrifugal force to increase the gas flow rate and output pressure. Due to the limitations of temperature rise and deformation of mechanical bearings, the motor cannot achieve high-speed operation. A relatively high gas output pressure is obtained by adopting a multistage compression method. There are problems such as complex equipment structure and relatively low operating efficiency.



多级离心鼓风机
Multistage Centrifugal Blower

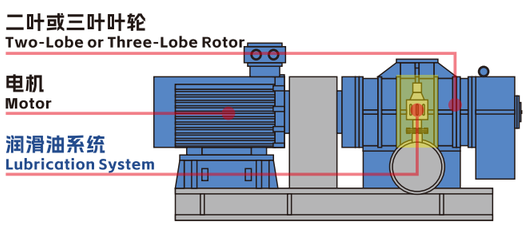


磁悬浮离心式鼓风机
Maglev Turbo Blower

磁悬浮离心式鼓风机采用磁浮轴承技术，实现轴与转子**无接触无润滑高速旋转**，彻底消除了机械轴承对电机转速的限制，电机转速最高可达52000rpm，电机与三元流叶轮直联，**无联轴器、无增速齿轮箱、无润滑油系统等部件，系统简单高效**。

The maglev turbo blower adopts magnetic bearing technology to realize contactless and lubrication-free high-speed rotation of the shaft and rotor, completely eliminating the limitation of mechanical bearings on the motor speed. The motor speed can reach up to 52,000 rpm. The motor is directly connected to the ternary flow impeller without components such as couplings, speed-increasing gearboxes, and lubricating oil systems. The system is simple and efficient.

机械轴承（有油摩擦的历史）Mechanical Bearing (history of oil friction)

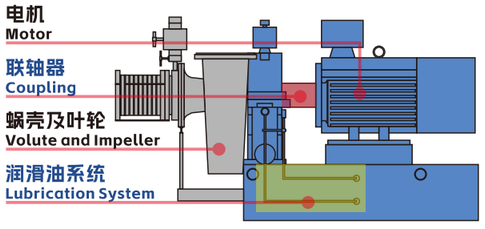


罗茨鼓风机
Roots Blower

罗茨鼓风机是一种容积式鼓风机，其主要原理是利用容积的变化来产生压缩气流，存在**运行效率低、工作噪音大**等问题。

The roots blower is a positive displacement blower. Its main principle is to use the change in volume to generate compressed air flow. There are problems such as low operating efficiency and high operating noise.

磁浮轴承（无油旋转的未来）Magnetic Bearing (future of oil-free rotation)



单级离心式鼓风机
Single-stage Centrifugal Blower

单级离心鼓风机通过增速齿轮箱提高叶片转速来规避轴承温升和变形磨损等问题，与多级离心鼓风机相比，减少了压缩级数，但因**增加了增速齿轮箱**，同时对齿轮箱加工精度要求非常高，提高了设备的制造成本并增加了维护难度。

The single-stage centrifugal blower avoids problems such as bearing temperature rise and deformation wear by increasing the blade speed through a speed-increasing gearbox. Compared with the multistage centrifugal blower, it reduces the number of compression stages. However, due to the addition of a speed-increasing gearbox, and at the same time, the processing accuracy requirements for the gearbox are very high, which increases the manufacturing cost of the equipment and increases the difficulty of maintenance.

磁悬浮离心式鼓风机
Maglev Turbo Blower

05.
产品优势 PRODUCT ADVANTAGES

无　油 Oil-free

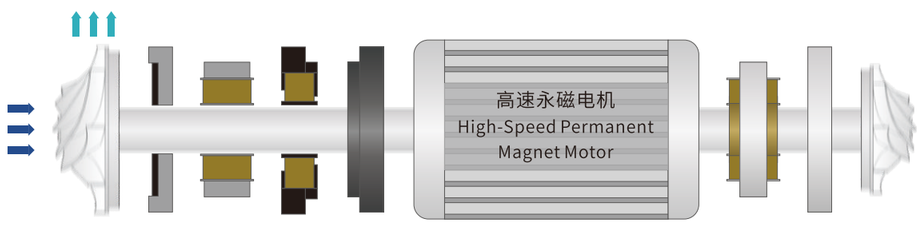
因采用磁浮轴承技术，省去了齿轮箱与油性轴承，运行过程中无需润滑，出风100%无油

The use of magnetic bearing technology eliminates the need for gearboxes and oil-lubricated bearings, resulting in lubrication-free operation and 100% oil-free output air.

无摩擦 No Friction

采用磁浮轴承，无机械接触，无摩擦损耗，使用寿命长。

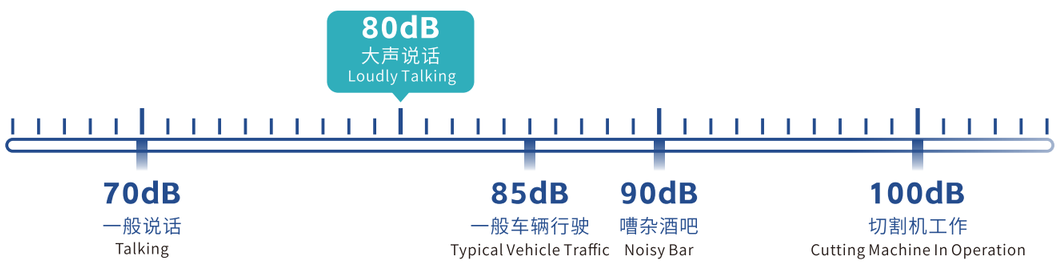
Uses magnetic bearings with no mechanical contact and no friction loss, resulting in a long service life.



低噪音低振动 Low Noise and Low Vibration

运行噪音低至80分贝，传动部件无机械摩擦，振动小

Operating noise is as low as 80 decibels, with minimal vibration due to the absence of mechanical friction in transmission components.

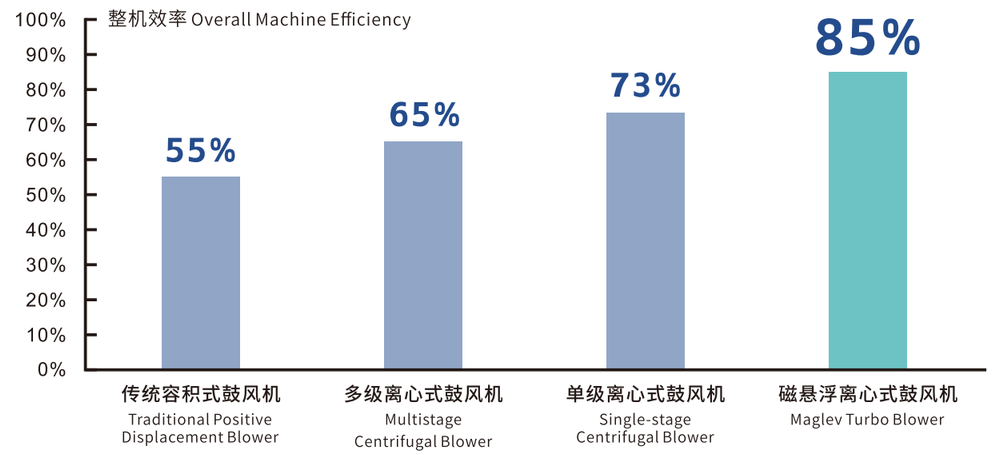


磁悬浮离心式鼓风机
Maglev Turbo Blower

节能高效 Energy-saving and Efficient

采用磁悬浮高速电机+任意扭曲三元流叶轮，电机效率超97%，系统结构无多余传动系统，整机效率超85%，与传统容积式鼓风机相比效率可提升约30%，与传统多级离心设备相比效率可提升约20%,与传统的齿轮增速单级离心设备相比效率可提升约12%

Utilizes a maglev high-speed motor and an arbitrarily twisted tri-foil impeller, with motor efficiency exceeding 97%. The system's structure has no redundant transmission components, resulting in an overall machine efficiency of over 85%. Compared to traditional positive displacement blowers, efficiency is improved by approximately 30%; compared to traditional multistage centrifugal equipment, efficiency is improved by approximately 20%; and compared to traditional gear-driven single-stage centrifugal equipment, efficiency is improved by approximately 12%.



低维护成本 Low Maintenance Cost

日常维护简单方便，只需定期更换低耗值空气过滤网。无润滑油系统,节约了润滑油的使用、处理、清洁等费用,大幅降低维护与维修成本

Daily maintenance is simple and convenient. Only the low-consumption air filter needs to be replaced regularly. There is no lubricating oil system, which saves the costs of using, handling, and cleaning lubricating oil, and greatly reduces maintenance and repair costs.

结构简单 Simple Structure

电机与叶轮直联，与罗茨鼓风机、传统离心鼓风机相比，无联轴器、增速齿轮箱、润滑油系统等部件，提高了系统效率，降低了维护难度

The motor is directly connected to the impeller, eliminating the need for components such as couplings, speed-increasing gearboxes, and lubrication systems, as found in Roots blowers and traditional centrifugal blowers. This improves system efficiency and reduces maintenance complexity.

磁悬浮离心式鼓风机
Maglev Turbo Blower

06.
产品参数 PRODUCT RARAMETERS

	名称 Name	数量 Quantity	备注 Remarks
机械部件 Mechanical Components	径向磁悬浮轴承 Radial Magnetic Bearing	2	
	轴向磁悬浮轴承 Axial Magnetic Bearing	2	
	一体化传感器 Integrated Sensor	2	
	磁悬浮高速电机 Maglev High-Speed Motor	1	
	叶轮 Impeller	1	高强度航空铝材 High-strength Aerospace Aluminum
	蜗壳 Volute	1	铸铝合金 Cast Aluminum Alloy
电气部件 Electrical Components	磁浮轴承控制器 Magnetic Bearing Controller	1	
	变频器 Variable Frequency Drive (VFD)	1	
	PLC 控制器 Programmable Logic Controller	1	
	控制面板 Control Panel	1	中英 可选 Chinese/English Optional
	DC电源 DC Power Supply	1	
	温度传感器 Temperature Sensor	2	
	压力传感器 Pressure Sensor	3	
	电气柜 Electrical Cabinet	1	Q235
冷却系统 Cooling System	鼓风机自冷却 Blower Self-cooling	1	冷却方式:风冷 Cooling Method: air cooling
其他 Others	进风口过滤器 Inlet Air Filter	1	3个月更换一次,具体更换频率视现场工况定 Replace every 3 months; specific
	电动旁通阀 Electric Bypass Valve	1	
	一体化隔音罩 Integrated Soundproof Cover	1	
	主电源空气开关 Main Power Circuit Breaker	1	

磁悬浮离心式鼓风机
Maglev Turbo Blower

型号含义 MODEL DESIGNATION

LL-B37

- 功率等级 Power Level (kW)
- 磁悬浮离心式鼓风机 Maglev Turbo Blower
- "凌翔"品牌"凌珑"系列 Lingxiang Brand and Linglong Series

产品参数 PRODUCT PARAMETERS

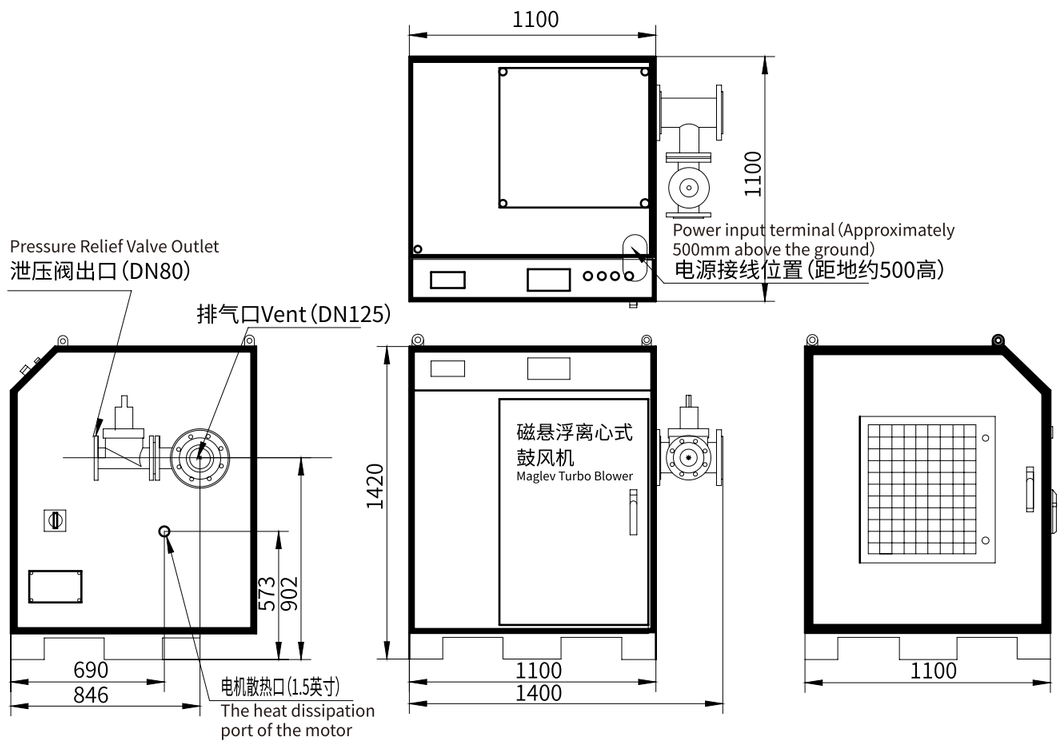
产品型号 Product Model	LL-B37	LL-B45	LL-B55	LL-B75	LL-B110	LL-B150	LL-B200	LL-B250	LL-B300
功率 Power(kW)	37	45	55	75	110	150	200	250	300
升压(kPa) Pressure Boost	流量Flow (m^3/min): 1 atm,20°C								
30	55	79	96						
40	45	68	74	90	120	195			
50	35	50	61	75	100	150	190	265	
60	32	43	52	65	85	135	175	215	260
70	27	37	46	55	75	120	155	195	235
80	20	33	41	50	70	105	135	165	200
90	23	30	37	45	60	90	125	160	190
100	20	28	34	40	55	88	115	140	170
110	17	24	31	35	45	75	109	135	165
120	15	20	30	30	40	65	100	125	150
重量(kg) Weight	600			900					
尺寸(mm) size	L=1100 W=1100 H=1420			L=1550 W=1400 H=1750					

注:除表中型号外,产品可根据客户需求定制

Note: In addition to the models listed in the table, products can be customized according to customer requirements.

磁悬浮离心式鼓风机
Maglev Turbo Blower

LL-B37电柜外形图 LL-B37 ELECTRICAL CABINET OUTLINE DRAWING

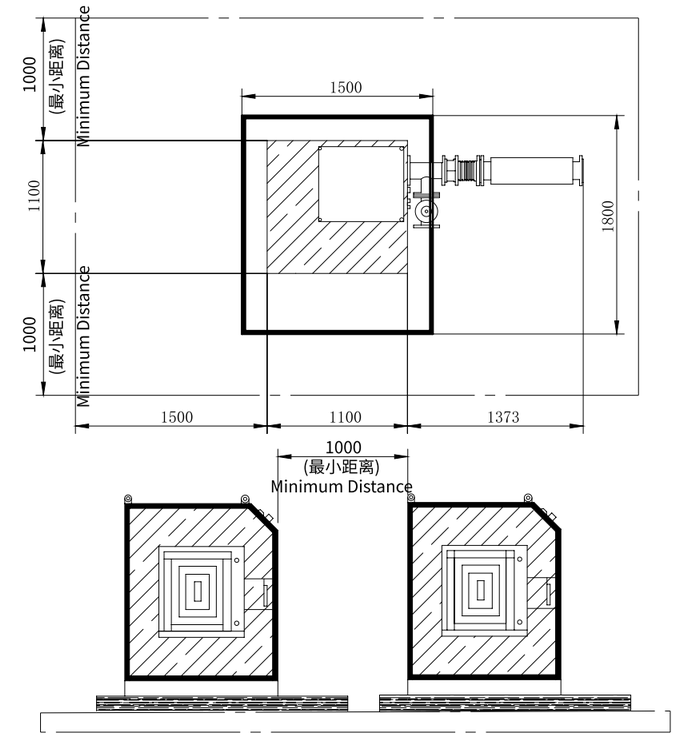


备注 NOTE

- 整机尺寸：L×W×H:1100mm×1100mm×1420mm
  Overall Dimensions:L×W×H:1100mm×1100mm×1420mm
- 设备重量：600kg
  Weight:600kg
- 出风口管径：DN125(GB1.0Mpa)可按需求变更标准，JIS/ANSI等
  Outlet Pipe Diameter：DN125(GB1.0Mpa)Customizable based on requirements,JIS/ANSI...
- 出风口处可按客户需求提供单向阀，蝶阀，柔性接头，出口消音器等配件
  At the air outlet, accessories such as check valves, butterfly valves, flexible joints, and outlet silencers can be provided according to customer requirements.
- 建议将电机散热口排出的热气通过管道排至室外，对有多台设备的风机机房，建议设置通风机
  It is recommended to discharge the gas exhausted from the motor heat dissipation port to the outdoors through pipes. For fan machine rooms with multiple devices, it is recommended to install ventilators.
- 电源接线为3×25mm²+1×10mm²三相四线,独立地线（注：不能零线、地线共用）
  The power connection is 3×25mm² + 1×10mm² three-phase four-wire with an independent ground wire. (Note: The neutral wire and ground wire cannot be shared.)

磁悬浮离心式鼓风机
Maglev Turbo Blower

LL-B37安装要求 LL-B37 INSTALL REQUIREMENTS



备注 NOTE

- 安装37kW磁悬浮离心式鼓风机时吸风口侧需预留至少1.5m的操作空间，其余周围需预留至少1.0m的操作空间
  When installing a 37kW maglev turbo blower, at least 1.5m of operating space should be reserved on the air inlet side, and at least 1.0m of operating space should be reserved around the rest.
- 多台鼓风机并列安装需避免吸风口正对
  When installing multiple blowers in parallel, avoid having the air intake sides directly facing each other.
- 从设备排气口依次安装**单向阀→波纹补偿器→消音器→阀门**后连接至主管道，顺序不能装错
  From the equipment exhaust port, install the check valve, corrugated compensator, silencer, and valve in sequence before connecting to the main pipeline. The order must not be incorrect.
- 视现场情况，可进行变径后连接到主管道
  Depending on the site conditions, the connection to the main pipeline can be made after changing the diameter.
- 建议将电机散热出风管与泄压出风管均通往室外
  It is recommended that both the motor heat dissipation air outlet duct and the pressure relief air outlet duct lead to the outdoors.
- 通过脚杯对磁悬浮鼓风机进行调平，**水平精度±1mm/m**
  Level the maglev blower through the leveling feet. The horizontal accuracy is ±1mm/m.