

HBE 系列 SERIES



HBE 液环真空泵

HBE LIQUID-RING VACUUM PUMP



Paper-making



Electric



Petrochemical



Coal



Irrigation and drainage

- 符合JB/T7255标准
Conform to JB/T7255 Standard
- 1995年通过ISO9001质量管理体系认证
Attained the ISO9001 quality management system authentication in 1995
- 2005年通过ISO10012:2003国际测量管理体系认证
Attained the ISO10012:2003 measurement management system authentication in 2005
- 2006年通过AAA级企业标准体系认证
Attained the AAA standardization system authentication in 2006
- 2011年通过ANSI/API Spec. Q1, ISO/TS29001质量管理体系认证
Attained ANSI/API Spec. Q1, ISO/TS29001 quality management system authentication in 2011



省级
化工泵
研发中心



ISO9001
质量管理
体系认证



杭州碱泵有限公司

HANGZHOU ALKALI PUMP CO.,LTD.

华泵新科技 省电省备件

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使用 前 请 详 细 阅 读
READ CAREFULLY BEFORE USING

一、HBE液环真空泵简介 INTRODUCTION TO HBE LIQUID-RING VACUUM PUMP

(一) 简介

HBE液环真空泵是公司开发制造的新一代节能产品，用于抽吸不含固体颗粒、不溶或微溶于工作液的气体，以便在密闭容器中形成真空和压力。该系列产品的特点是：

- 装有柔性阀板的排气口，能自动调节排气角，有效地防止了排气过程中的过压缩，泵在不同的吸入压力下高效运行。

- 配有排水阀，控制泵的起动液位，避免了过载起动。

- 泵的转动部分在工作腔内无接触运行，轴向及径向载荷分别由不同的轴承承担，运行平稳，安全可靠。

- 侧盖上开有观察孔，只要打开观察孔盖即可检查泵的腐蚀、结垢等情况，方便设备检修。

- 工作过程接近等温压缩，特别适合易燃易爆气体的输送。

- 具有填料密封和机械密封两种结构，适应不同的轴封需要。

- 叶轮与泵轴采用热装过盈配合，性能可靠，运行平稳。

- 通过改变与介质接触的过流部件材料，可以满足抽吸腐蚀气体或以腐蚀性液体作工作液工况的防腐蚀要求。

(二) 用途

电力工业：负压除灰。

石油化工：真空蒸馏、真空结晶、脱水油田。

烟草行业：真空系统。

制药行业：真空系统。

造纸工业：真空系统以及各种真空获得过程。

制气过程：变压吸附。

1. Introduction

HBE liquid-ring vacuum pump is an energy-saving product developed by our company, and is used to pump gas which carries no solids undissolved or just slightly dissolved in working liquid, to form vacuum and pressure in the closed container. The characteristics of this series product are as followings:

- As the result of the flexible valve provided in the outlet to adjust the discharge angles, the pump can work efficiently at different suction conditions.

- Using an automatic discharge valve, the liquid level can be controlled well to prevent over-load start-up.

- The rotating parts of the pump do not contact each other in the working chamber. Axial and radial load is borne by different bearings, being Stable, safe and reliable.

- There is observation hole on the side cover, pump's corrosive and scaling conditions can be observed through the hole, it is easy to maintain.

- The working process is close to isothermal compression, particularly suitable for the delivery of flammable and explosive gases.

- There are packing seal and mechanical seal two kinds of structures to meet the needs of the different seals.

- The impeller and shaft adopt thermal interference fit, with reliable performance and smooth operation.

- By changing materials of the wetted parts in contact with the medium, the pumps can transfer the corrosive gases or meet the anti-corrosion requirements under the working condition with corrosive liquids as working fluid.

2. Applications

Power industry: negative pressure dedusting.

Petrol-chemical industry: vacuum distillation, vacuum crystallization, dewatering in oil fields.

Tobacco industry: vacuum system.

Pharmaceutical industry: vacuum system.

Paper making industry: vacuum system and vacuum process.

Gas production: variable-pressure adsorption system.

煤炭及矿业：真空浮选与过滤。

塑料橡胶工业：真空成型。

食品行业：食品包装和真空干燥。

排溉和排水工程行业：真空启动。

Coal and mine industry: Vacuum sorting and filtering.

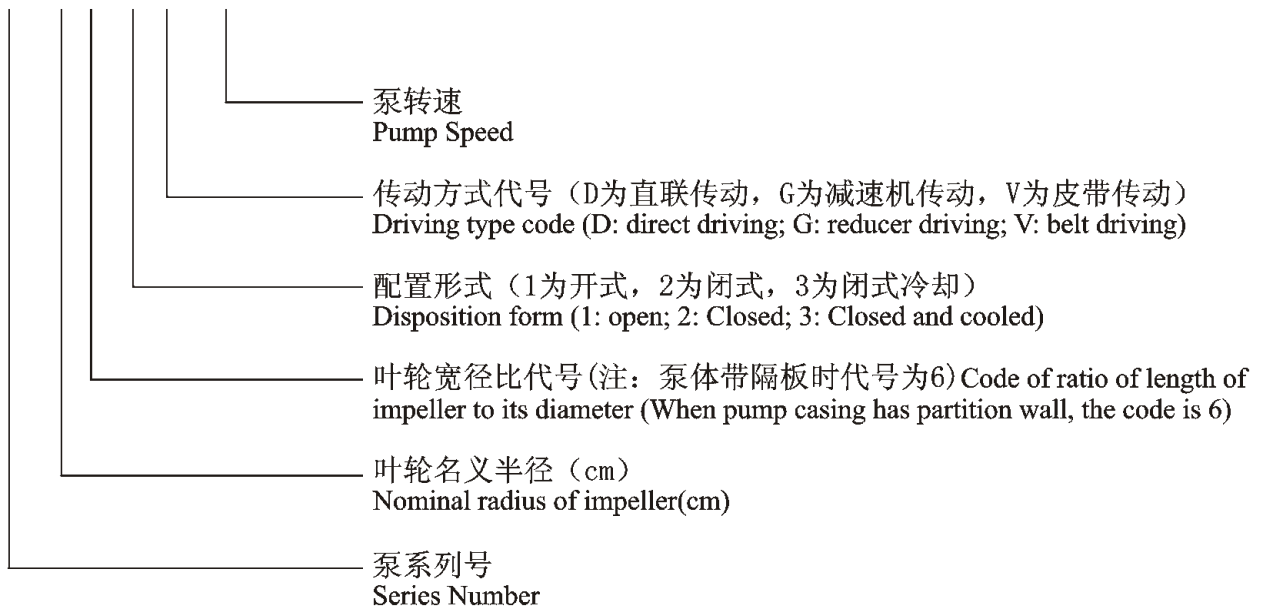
Plastic and rubber industry: Vacuum forming.

Food industry: Food packing and vacuum drying.

Irrigation and drainage industry: Vacuum priming.

(三) 型号举例说明 PUMP MODEL ILLUSTRATION

HBE 25 3 - 1 D / 740

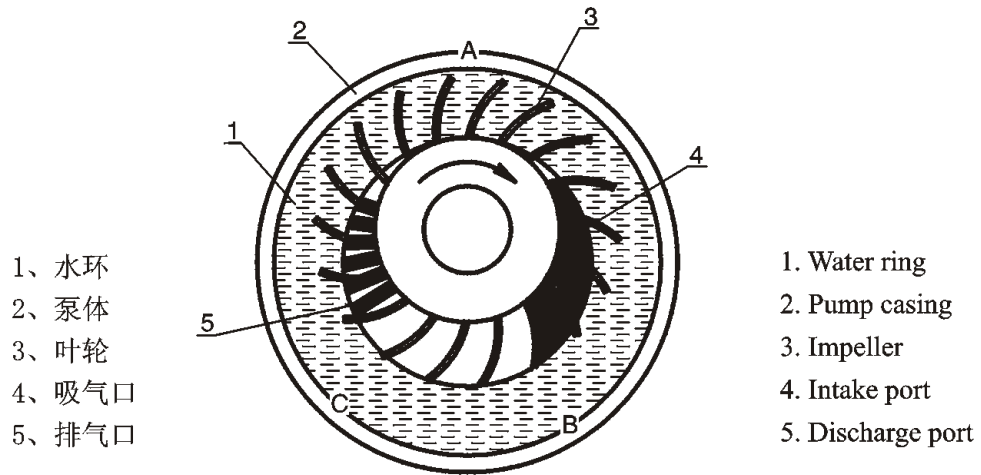


(四)、工作原理

叶轮偏心地装在接近圆形的泵体内，当叶轮按图示箭头方向旋转时，因离心力的作用，注入泵内的液体被甩向泵体内壁，形成一个形状与泵体相似，厚度接近相等的液环，随叶轮一起旋转的液环内表面与叶轮轮毂之间形成一个月牙空间，当叶轮由 A 点转到 B 点时，两相邻叶片之间所包围的容腔渐渐增大，气体由吸气口吸入，当叶轮由 C 点转到 A 点时，相应的容腔由大变小，使原先吸入的气体受到压缩，当压力达到排气口压力时，气体被排出。

4. Working principle

The impeller is assembled eccentrically inside the casing. When the impeller revolves as the indicated direction in above figure, the liquid is thrown outwards under centrifugal force to form a liquid ring rotating concentrically with the casing. As a result, a crescent pocket area is developed between hub and the inner surface of the liquid ring. As rotation proceeds from point A to point B, the pockets area between adjacent wanes becomes progressively larger, i.e vacuum is set up and gas is drawn in via the suction port. And as rotation proceeds from point C to point A, the pocket becomes smaller and smaller, the gas is compressed to be as much as outside pressure, then it is finally ejected out though discharge port.

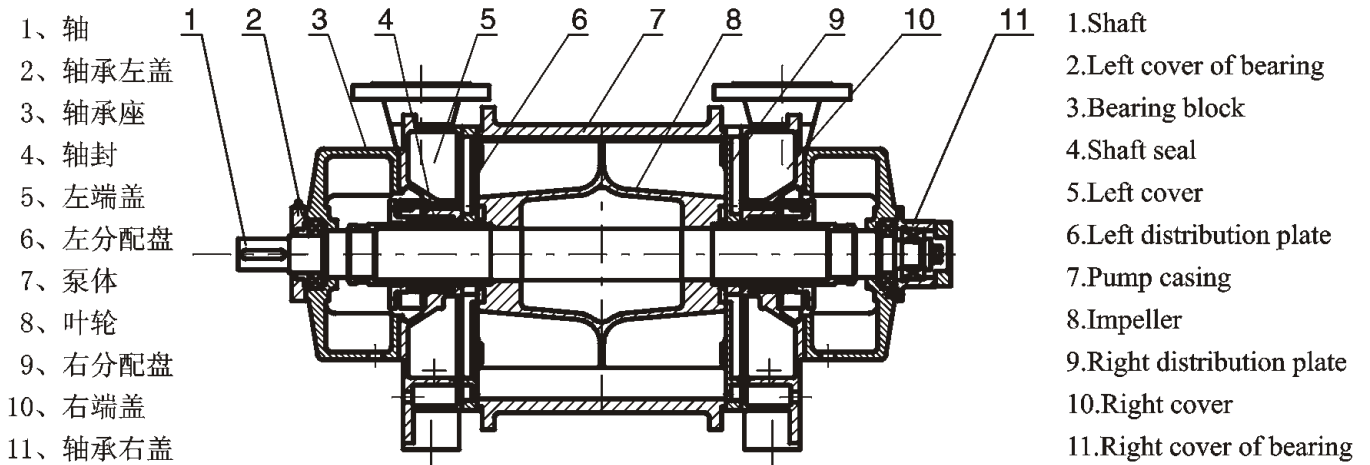


- 1、水环
- 2、泵体
- 3、叶轮
- 4、吸气口
- 5、排气口

- 1. Water ring
- 2. Pump casing
- 3. Impeller
- 4. Intake port
- 5. Discharge port

二、主泵结构 STRUCTURE

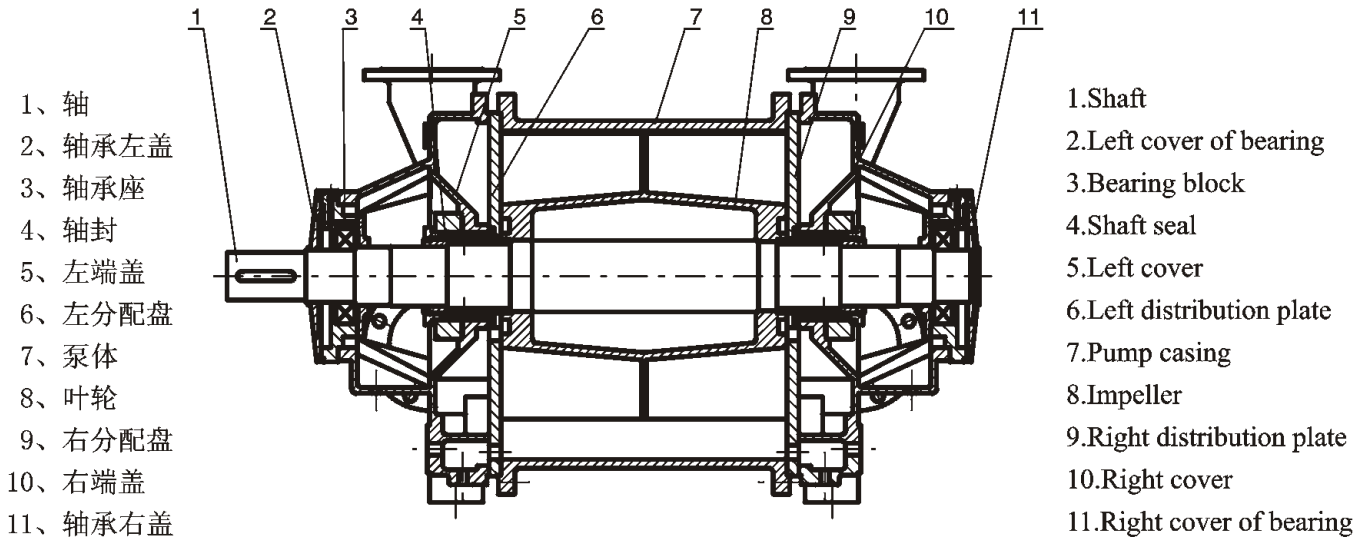
HBE10~HBE25结构图 HBE10-HBE25 structural drawing



- 1、轴
- 2、轴承左盖
- 3、轴承座
- 4、轴封
- 5、左端盖
- 6、左分配盘
- 7、泵体
- 8、叶轮
- 9、右分配盘
- 10、右端盖
- 11、轴承右盖

- 1. Shaft
- 2. Left cover of bearing
- 3. Bearing block
- 4. Shaft seal
- 5. Left cover
- 6. Left distribution plate
- 7. Pump casing
- 8. Impeller
- 9. Right distribution plate
- 10. Right cover
- 11. Right cover of bearing

HBE30~HBE50结构图 HBE30-HBE50 structural drawing



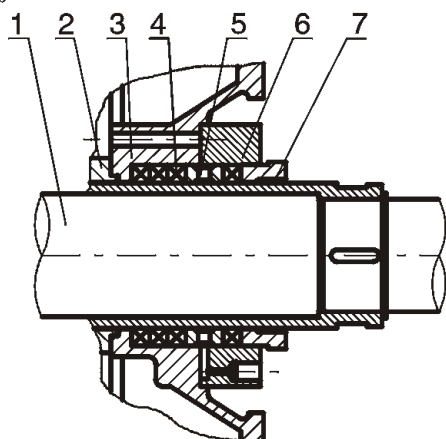
- 1、轴
- 2、轴承左盖
- 3、轴承座
- 4、轴封
- 5、左端盖
- 6、左分配盘
- 7、泵体
- 8、叶轮
- 9、右分配盘
- 10、右端盖
- 11、轴承右盖

- 1. Shaft
- 2. Left cover of bearing
- 3. Bearing block
- 4. Shaft seal
- 5. Left cover
- 6. Left distribution plate
- 7. Pump casing
- 8. Impeller
- 9. Right distribution plate
- 10. Right cover
- 11. Right cover of bearing

三、泵的密封 PUMP SEAL

(一)、填料密封

填料密封是泵常采用的一种经济实用轴封方式，特别是大规格的泵。轴封的冷却方式有两种，一种为内供水方式，一种为外供水方式。采用不同的轴封冷却方式，填料套的安装方向不同。当要改变冷却方式时，须旋转填料套安装方向，并按要求改变供水管路。当为外供水方式时，泵运行前须先通冷却水。



填料密封示意图
Figure of Packing seal

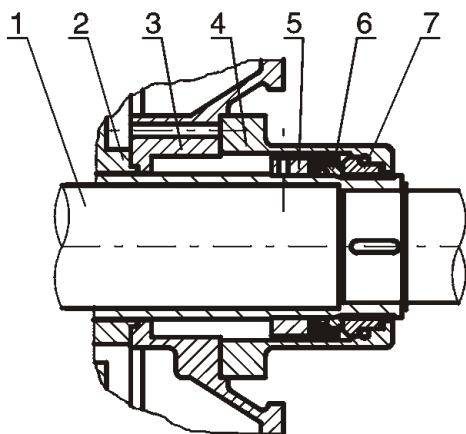
1. Packing seal

Packing seal is an economical and practical shaft seal way that pumps, especially large-sized ones, often adopt. There are two ways of cooling shaft seal, one of which is internal water supply way, another is external water supply one. Different cooling ways require different installing direction of the packing sleeve, so when the change of cooling way is needed, the direction of packing sleeve should be rotated, meanwhile, water supply way should be also changed. When external water supply way is adopted, pump should be connected with cooling water before operating.

- | | |
|--------|----------------------|
| 1、轴 | 1. Shaft |
| 2、分配盘 | 2. Distributor plate |
| 3、端盖 | 3. Cover |
| 4、填料 | 4. Packing |
| 5、隔环 | 5. Spacer ring |
| 6、填料套 | 6. Packing sleeve |
| 7、填料压盖 | 7. Packing gland |

(二)、单端面机械密封

单端面机械密封具有密封可靠，使用寿命长等特点。由于密封压力低，采用非平衡型机械密封，结构紧凑。当轴封为单端面机械密封时，轴封冷却方式均采用内供水方式，泵运转时无须提供外轴封冷却水，由泵内供水冷却机封。



单端面机械密封示意图
Figure of single seal

2. Single mechanical seal

Single mechanical seal possesses the advantages of sealing reliability and long service life. Due to low sealing pressure, non-balanced mechanical seal is adopted, with compact structure. When single mechanical seal is used, the cooling way for shaft sealing adopts internal water supply, pump operates without external cooling water, and adopts self cooling way.

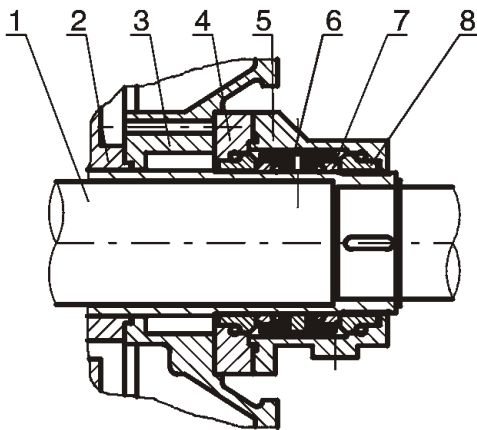
- | | |
|--------|--------------------------|
| 1、轴 | 1. Shaft |
| 2、分配盘 | 2. Distributor plate |
| 3、端盖 | 3. Cover |
| 4、机封压盖 | 4. Mechanical seal gland |
| 5、动环座 | 5. Dynamic ring seat |
| 6、动环 | 6. Dynamic ring |
| 7、静环 | 7. Static ring |

(三)、双端面机械密封

使用双端面机械密封的目的是要在密封腔内创造一个人工环境使密封能长期无故障运行。当泵送有毒、易燃、易爆严禁泄漏气体时，创造这样一个环境是必要的。但它必须由外部向密封室提供清洁液体，作为缓冲液体或阻隔液体。依靠一个内部的循环回路或外部的压力系统来循环液体。典型的密封管路系统如API682方案52、53、54。

3. Dual mechanical seal

The goal to apply dual mechanical seal is to create an artificial environment in seal chamber to enable seal to operate without trouble for a long time. When toxic, volatile, combustible or explosive liquid is pumped. It is very necessary to create such an environment. An external reservoir with pressure must be used to supply clear isolating liquid which circulates in an internal cyclic loop or external flush system. The pressure of isolating liquid should be greater than that of medium. Dual mechanical seal can mate carious seal piping systems to make seal plans recommended by API682, for example typical seal plan52, 53 or 54.

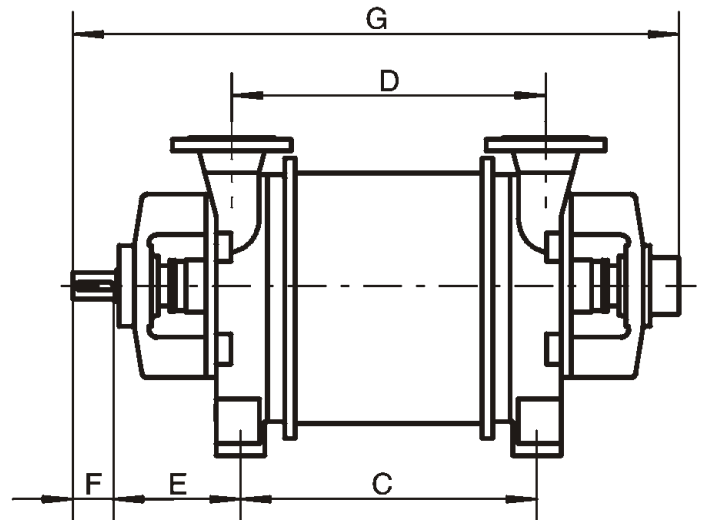
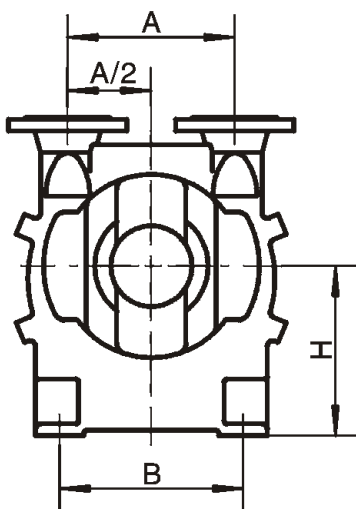


双端面机械密封示意图
Figure of dual mechanical seal

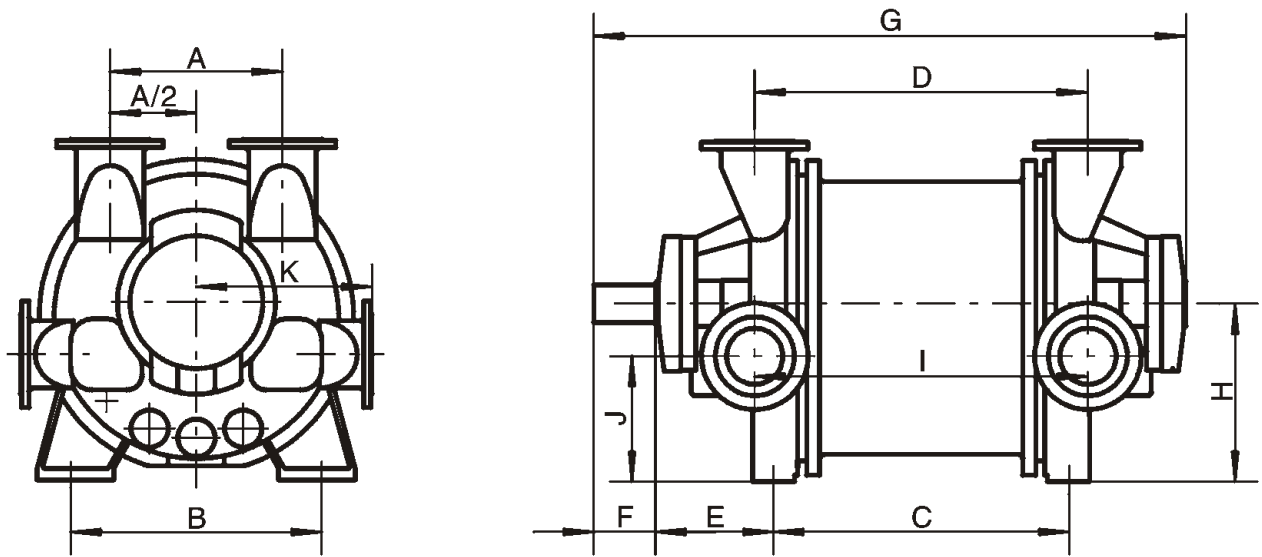
- | | |
|--------|--------------------------|
| 1、轴 | 1. Shaft |
| 2、分配盘 | 2. Distributor plate |
| 3、端盖 | 3. Cover |
| 4、前压盖 | 4. Front gland |
| 5、机封压盖 | 5. Mechanical seal gland |
| 6、动环座 | 6. Dynamic ring seat |
| 7、动环 | 7. Dynamic ring |
| 8、静环 | 8. Static ring |

四、主泵外形安装尺寸 PUMP OUTLINE AND INSTALLATION DIMENSIONS

HBE10~HBE25 型外形及安装尺寸图 HBE10-HBE25 Pump outline and installation dimensions



HBE30~HBE50 型外形及安装尺寸图 HBE30-HBE50 Pump outline and installation dimensions

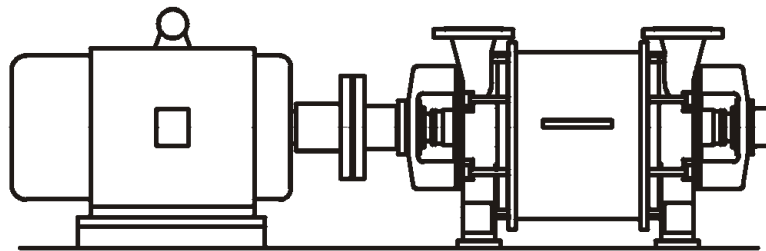


型号 Pump Model	主泵外形安装尺寸 pump outline and installation dimensions										
	A	B	C	D	E	F	G	H	I	J	K
HBE102	210	220	252	262	195	76	750	180	-	-	-
HBE103	210	220	317	327	195	76	795	180	-	-	-
HBE152	250	260	320	330	208	76	845	225	-	-	-
HBE153	250	260	380	390	208	76	905	225	-	-	-
HBE202	310	340	395	425	230	82	995	315	-	-	-
HBE203	310	340	515	545	230	82	1115	315	-	-	-
HBE204	310	340	550	580	230	82	1150	315	-	-	-
HBE252	430	465	520	570	270	120	1245	400	-	-	-
HBE253	430	465	670	720	270	120	1395	400	-	-	-
HBE303	460	670	790	890	315	165	1590	475	890	335	470
HBE353	570	750	950	1050	320	165	1760	560	1050	360	575
HBE355	570	750	1080	1180	320	165	1890	560	1180	360	575
HBE403	600	875	1102	1168	378	250	1090	620	1168	560	625
HBE405	600	875	1392	1458	378	250	2380	620	1458	560	625
HBE503	770	1120	1502	1568	405	300	2595	775	1568	698	750
HBE505	770	1120	1752	1818	405	300	2845	775	1818	698	750

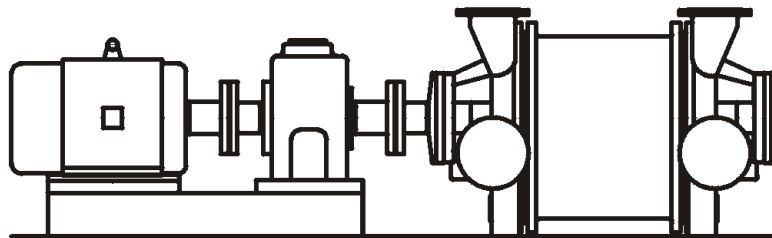
五、 驱动器及传动方式 DRIVING AND COUPLING

主泵的驱动机为电机，传动方式有联轴器直联传动、皮带轮传动和齿轮减速器传动。直联传动时，联轴器选用爪形弹性联轴器或弹性套柱销联轴器，依据客户需求可用金属膜片联轴器。

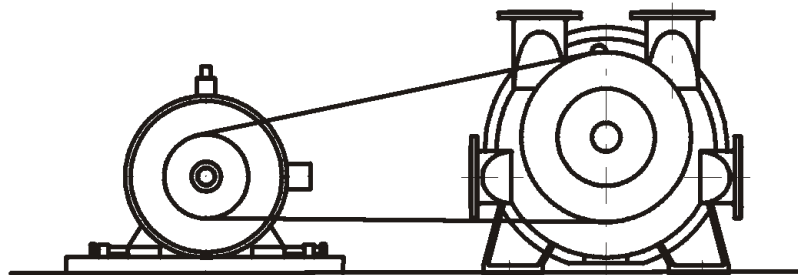
The driving machine for the main pump is electric motor, the driving ways are coupling direct drive type, belt drive type and gear reducer drive type. For direct drive, the claw elastic coupling or elastic sleeve pin coupling is used, metal slice coupling is also available according to customers' requirements.



联轴器直联传动方式 Coupling direct drive type



齿轮减速传动方式 Gear reducer drive type



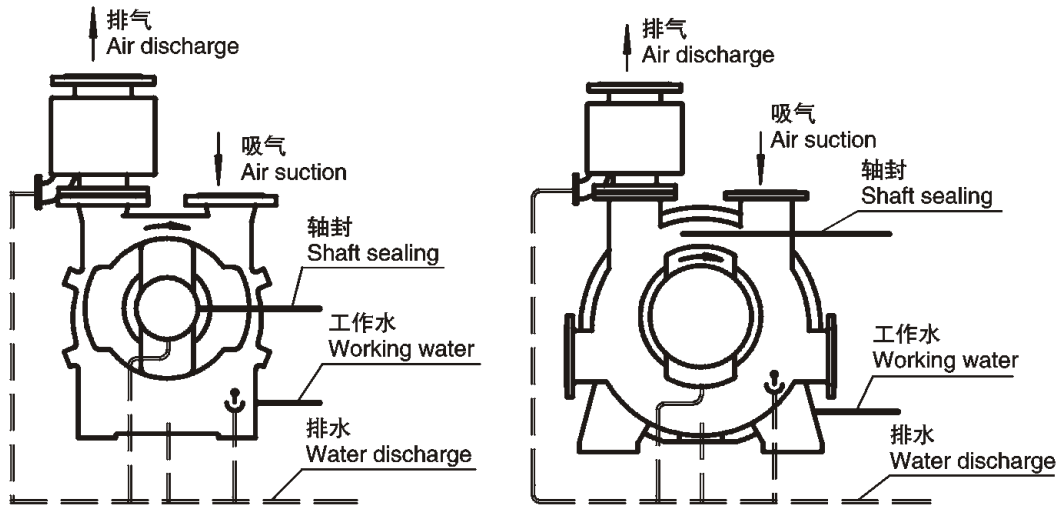
皮带轮传动方式 Belt drive type

六、 管路系统配置 PIPING SYSTEM CONFIGURATION

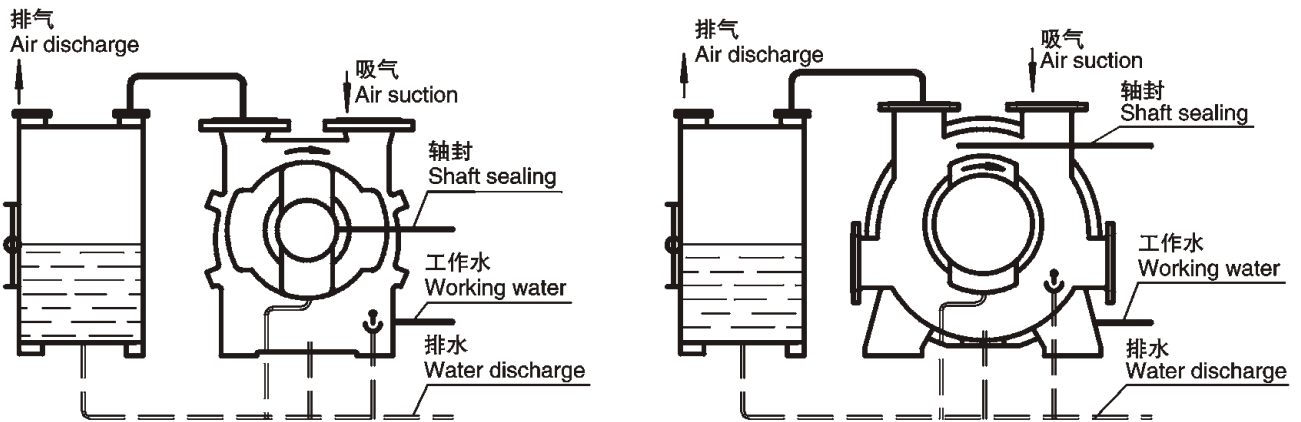
管路系统的布置根据不同的使用特点，可参照下图布置形式(推荐选用闭式循环冷却供水系统)：

Piping system can be arranged according to different usage characteristics, The followings are as reference (closed circulating & cooling water supply system is recommended):

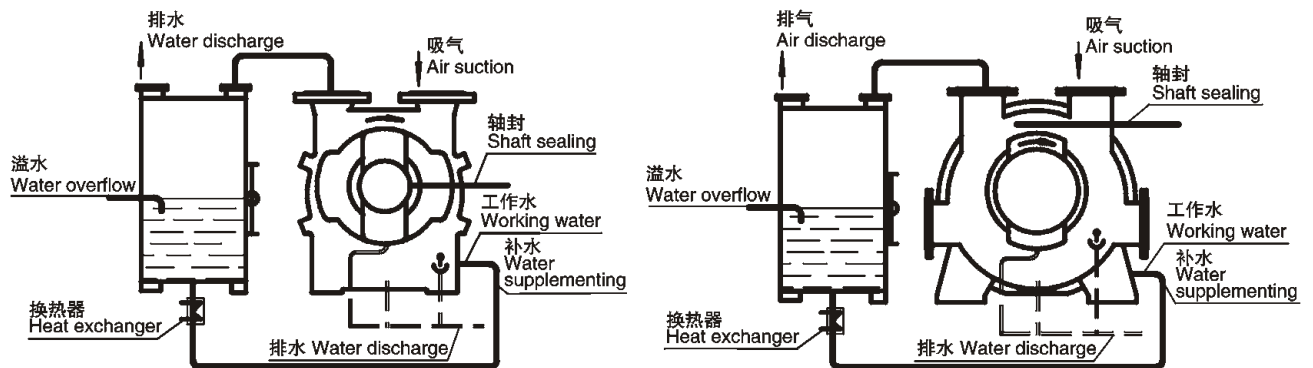
(一)、开式供水系统 Open water supply system



(二)、闭式循环供水系统 Closed circulating water supply system

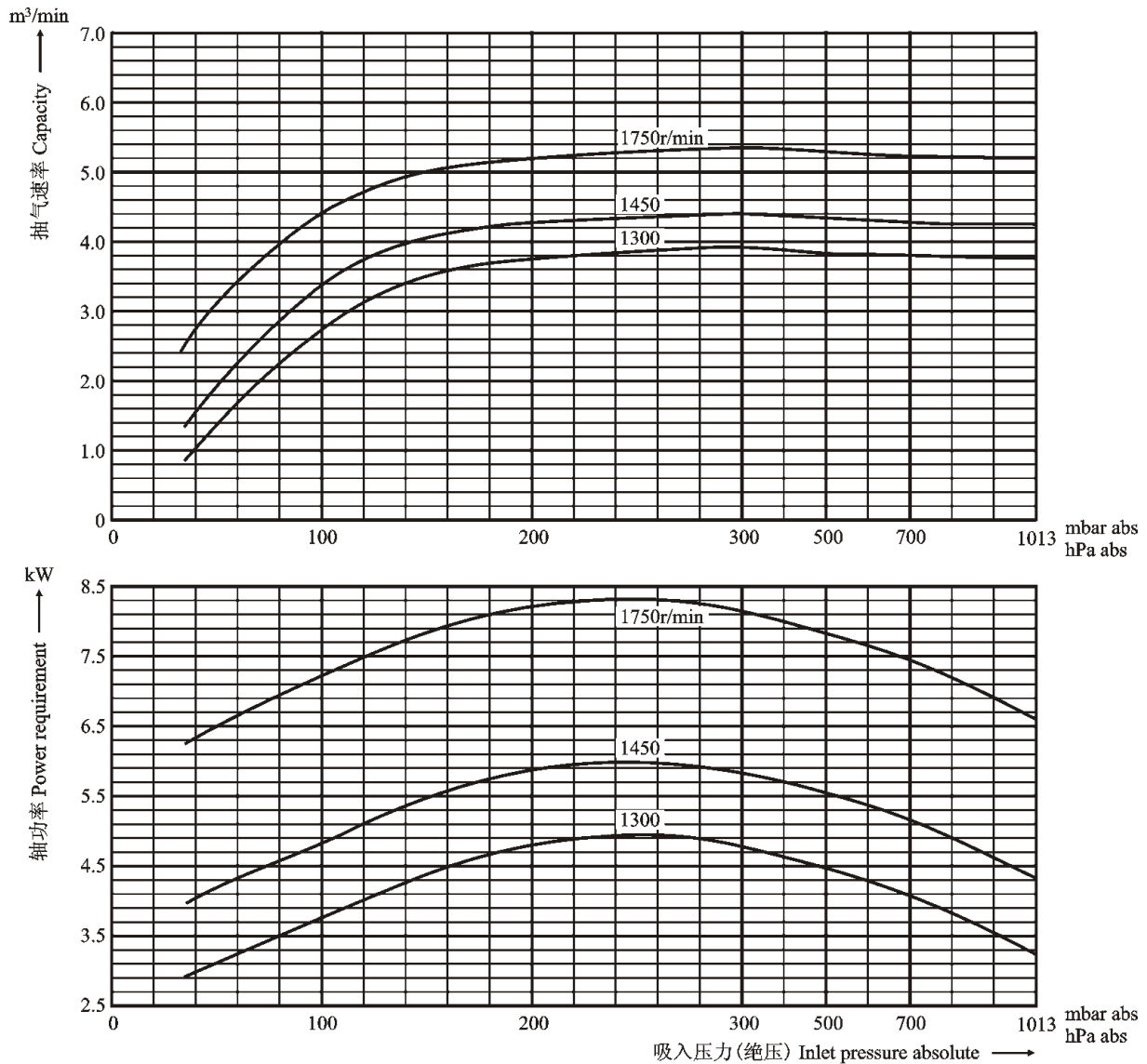


(三)、闭式循环冷却供水系统 Closed circulating & cooling water supply system



七、性能曲线 PERFORMANCE CURVES

(一) HBE102性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
1750	2.1~2.5	1.2~2.1	0.5~1.2
1450	1.7~2.1	1.0~1.7	0.4~1.0
1300	1.5~1.9	0.9~1.5	0.4~0.9

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空气是指在对应吸入的状态下，其相对湿度为100%的湿空

气)。2、性能允差±10%。3、带上P型喷射器，吸入压力可低于33mbar。

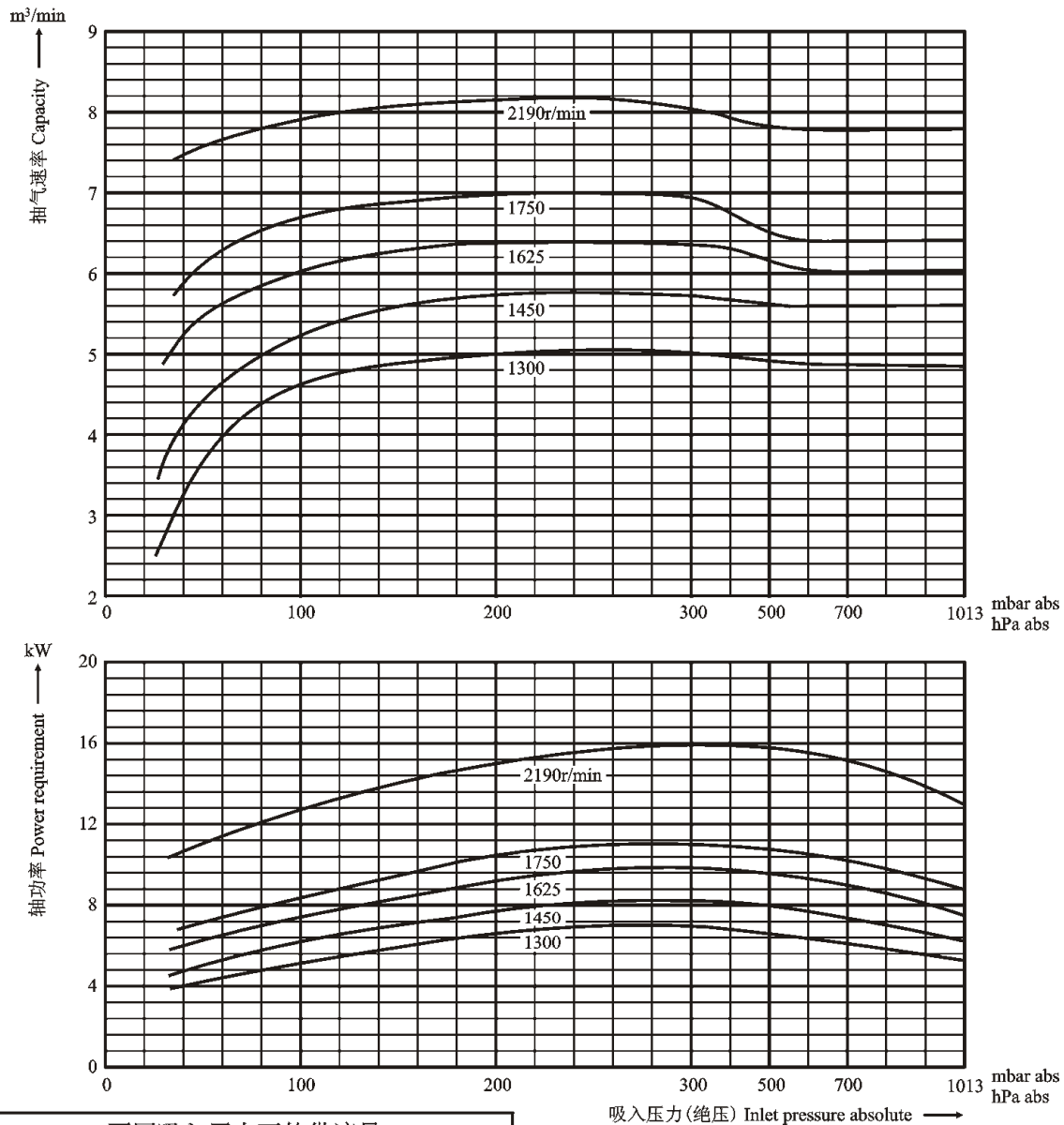
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10%.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(二) HBE103性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
2190	2.1~3.3	1.5~2.7	0.8~1.7
1750	1.7~2.7	1.2~2.2	0.6~1.3
1625	1.6~2.5	1.1~2.0	0.6~1.2
1450	1.4~2.2	1.0~1.8	0.5~1.1
1300	1.3~2.0	0.8~1.7	0.4~1.0

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

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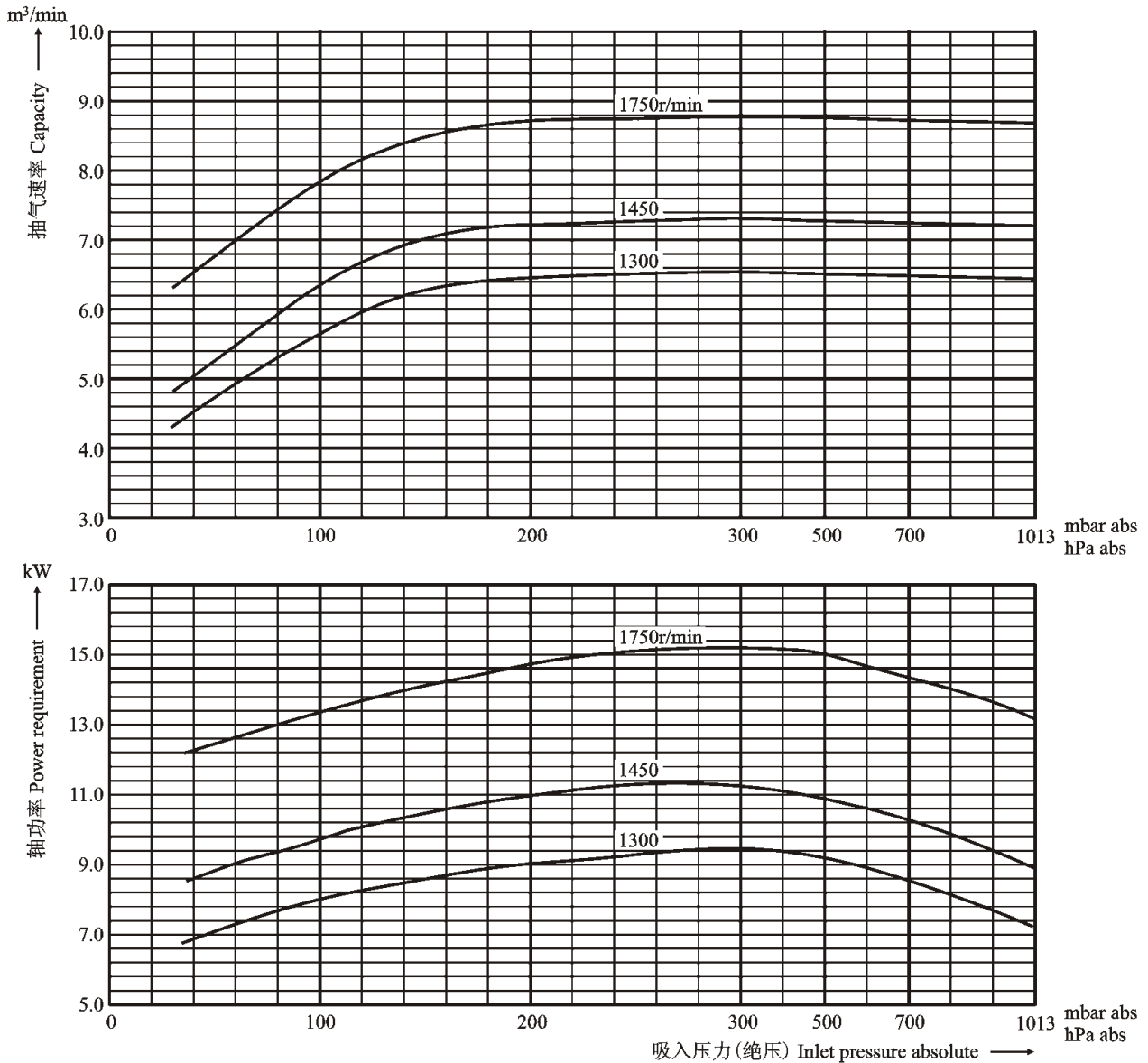
Notes:

1.These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2.The tolerance about capacity and power requirement should be in range of 10%.

3.Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(三) HBE152性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
1750	2.1~3.5	1.2~2.2	0.6~1.3
1450	1.7~2.9	1.0~1.8	0.5~1.1
1300	1.5~2.6	0.9~1.6	0.5~1.0

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空气是指在对应吸入的状态下，其相对湿度为100%的湿空

气)。2、性能允差±10%。3、带上P型喷射器，吸入压力可低于33mbar。

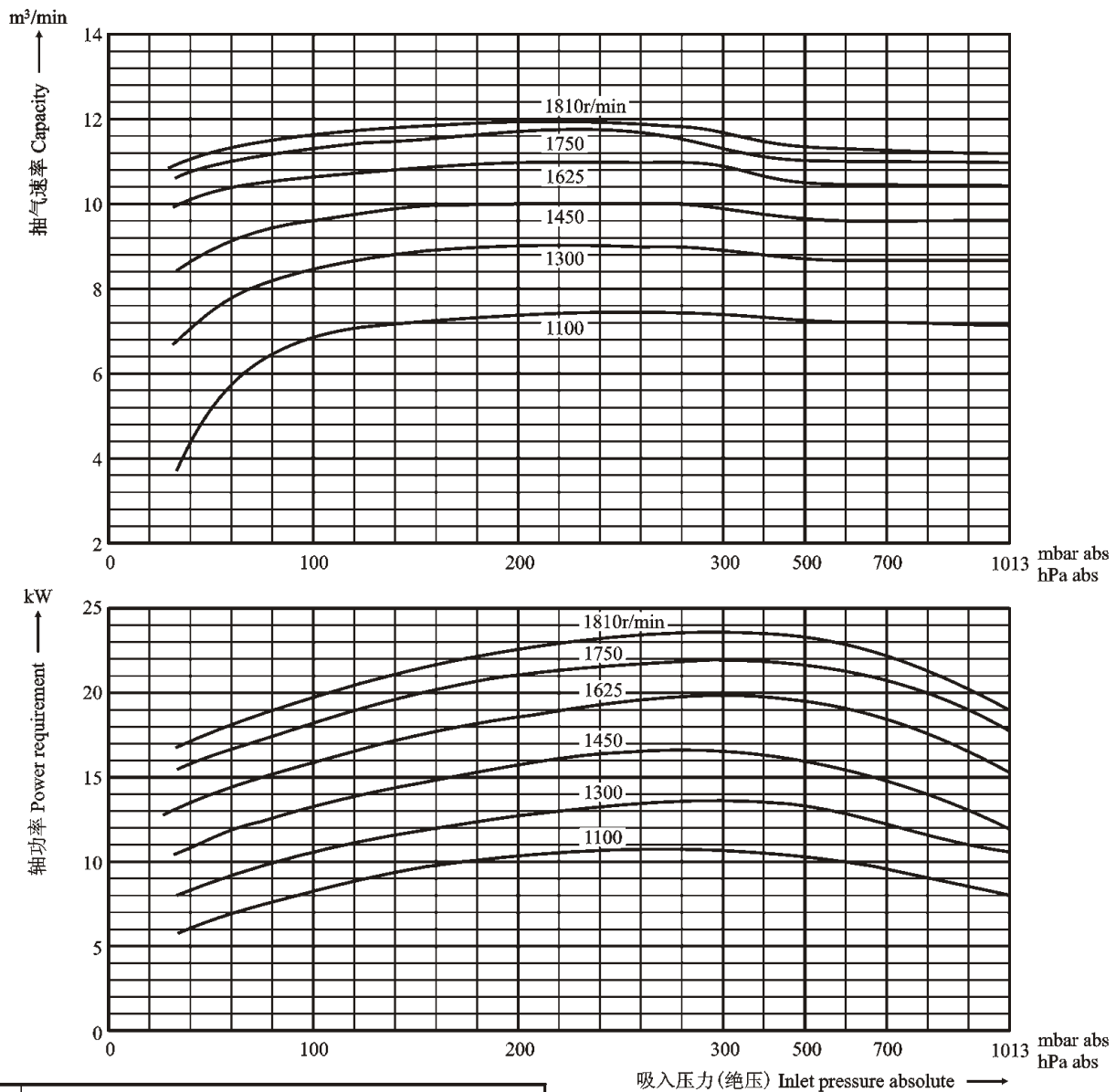
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10%.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(四) HBE153性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
1810	2.4~3.8	1.3~2.5	0.9~1.4
1750	2.3~3.7	1.2~2.4	0.9~1.3
1625	2.1~3.6	1.1~2.2	0.8~1.2
1450	1.9~3.0	1.0~2.0	0.7~1.1
1300	1.7~2.7	0.9~1.8	0.7~1.0
1100	1.5~2.3	0.8~1.5	0.6~0.8

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注: 1、上述性能基于进气温度20℃, 进水温度15℃, 排气压力1013mbar的条件, 被吸入气体为饱和空气(饱和空

气是指在对应吸入的状态下, 其相对湿度为100%的湿空气)。2、性能允差±10%。3、带上P型喷射器, 吸入压力可低于33mbar。

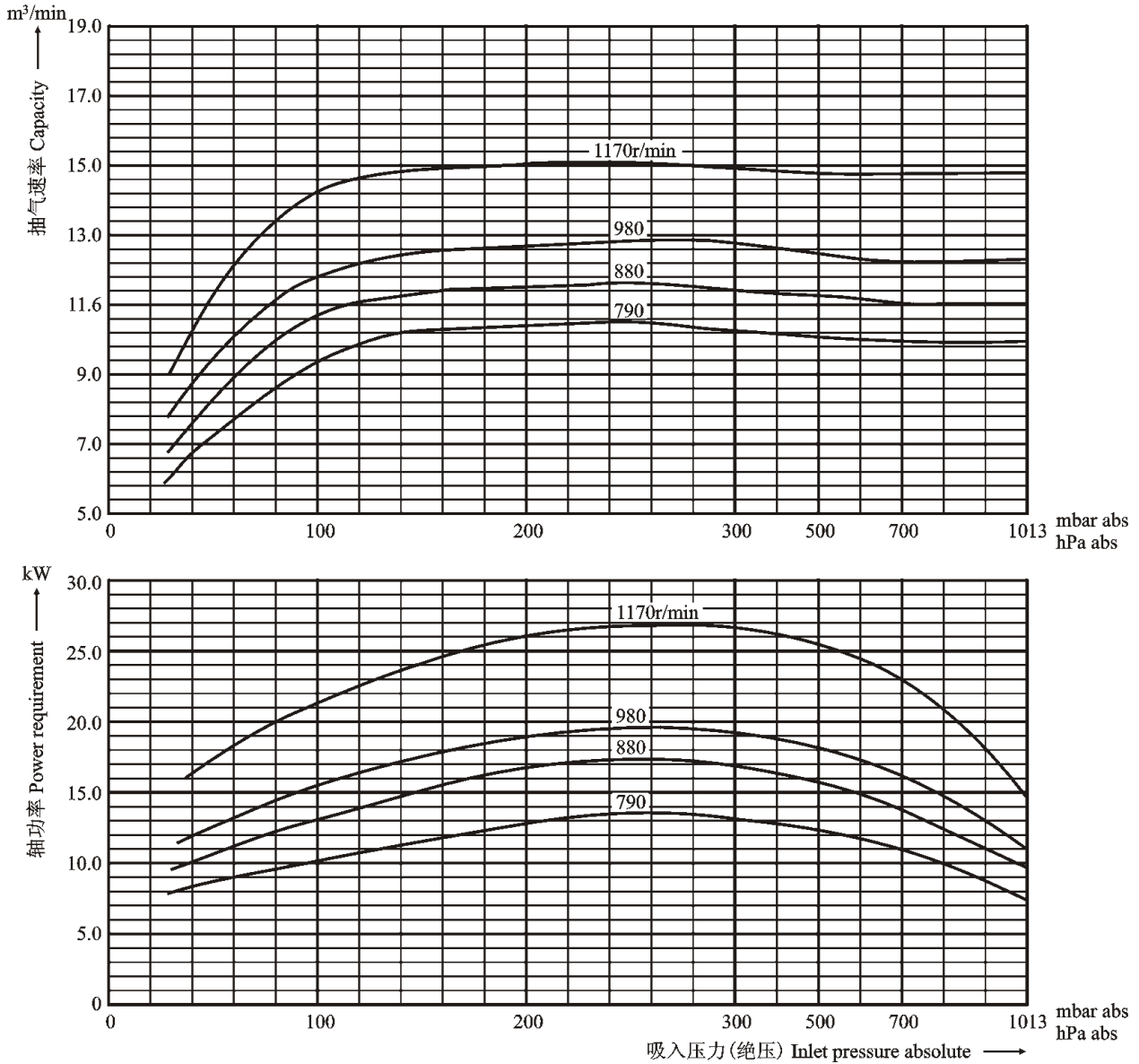
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10%.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(五) HBE202性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
1170	2.4~4.8	1.7~3.0	0.9~1.9
980	2.0~4.0	1.4~2.5	0.7~1.6
880	1.8~3.6	1.3~2.3	0.6~1.5
790	1.6~3.2	1.1~2.0	0.6~1.1

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空气是指在对应吸入的状态下，其相对湿度为100%的湿空

气)。2、性能允差±10%。3、带上P型喷射器，吸入压力可低于33mbar。

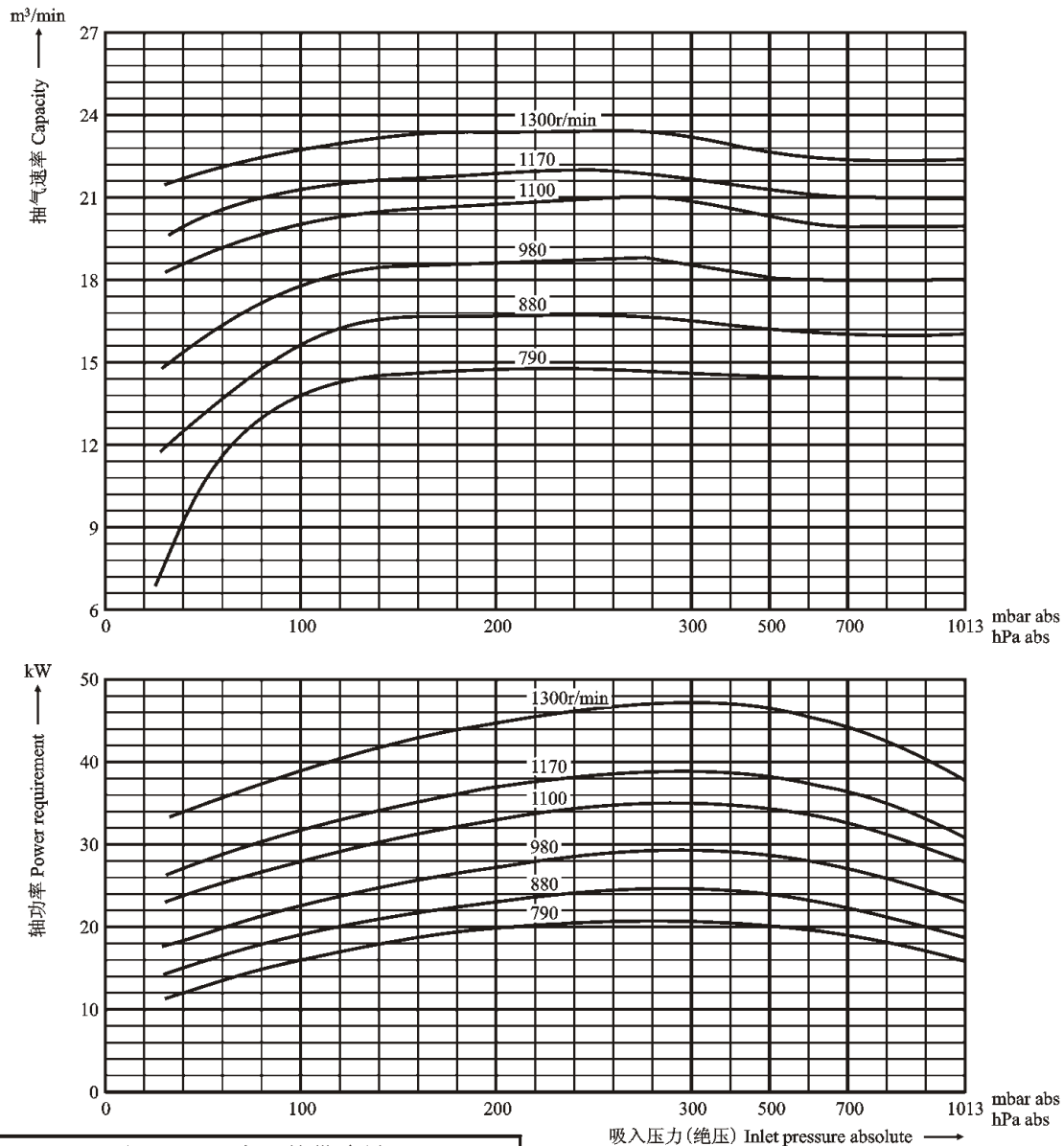
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10%.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(六) HBE203性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
1300	3.0~4.5	2.3~3.0	1.0~1.5
1170	3.0~4.0	2.0~2.7	0.9~1.5
1100	2.9~3.9	1.9~2.6	0.8~1.3
980	2.6~3.6	1.7~2.4	0.8~1.2
880	2.3~3.3	1.5~2.2	0.6~1.1
790	2.1~3.1	1.4~2.1	0.5~1.0

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空

气是指在对应吸入的状态下，其相对湿度为100%的湿空气)。2、性能允差±10%。3、带上P型喷射器，吸入压力可低于33mbar。

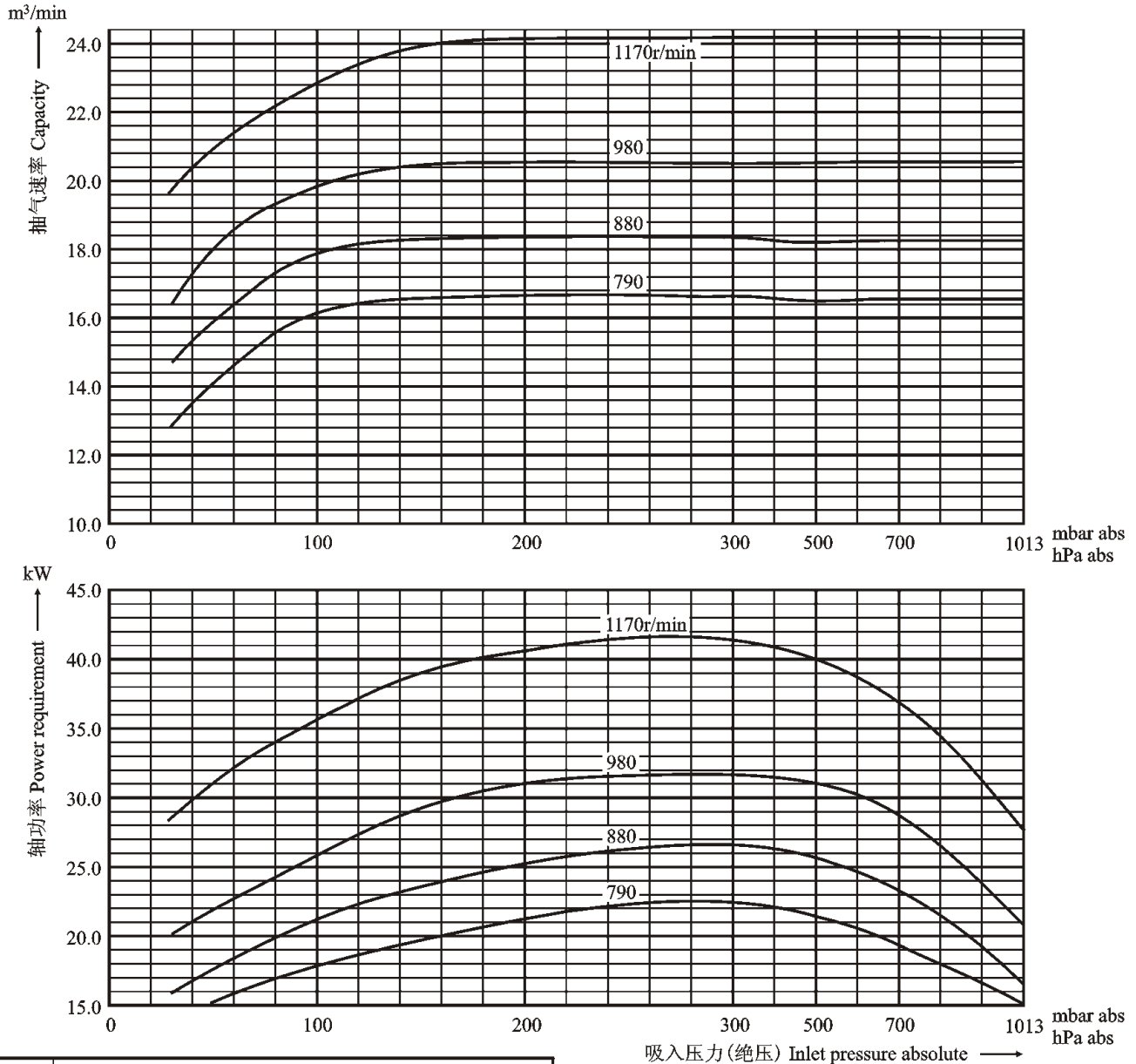
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10%.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(七) HBE204性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
1170	3.6~7.2	2.5~4.3	1.2~2.9
980	3.0~6.0	2.1~3.6	1.0~2.4
880	2.7~5.4	1.9~3.2	0.9~2.2
790	2.4~4.8	1.7~2.9	0.8~2.0

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空气是指在对应吸入的状态下，其相对湿度为100%的湿空

气)。2、性能允差±10%。3、带上P型喷射器，吸入压力可低于33mbar。

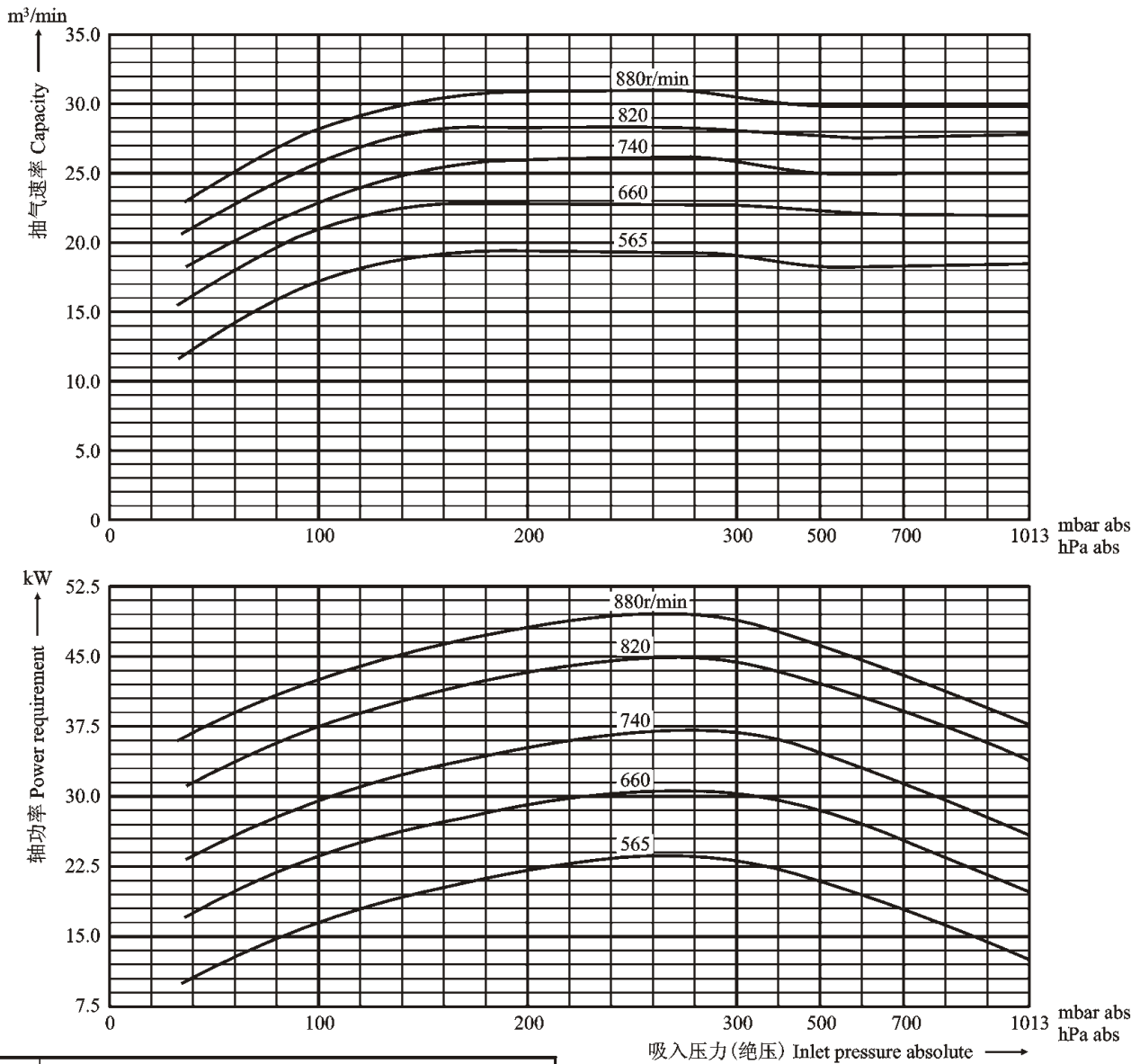
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10%.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(八) HBE252性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
880	4.4~7.1	3.0~4.4	1.7~3.0
820	4.1~6.6	2.8~4.1	1.6~2.8
740	3.7~6.0	2.5~3.7	1.4~2.5
660	3.3~5.4	2.2~3.3	1.2~2.2
565	2.8~4.6	1.9~2.8	1.1~1.9

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空气是指在对应吸入的状态下，其相对湿度为100%的湿空

气)。2、性能允差±10%。3、带上P型喷射器，吸入压力可低于33mbar。

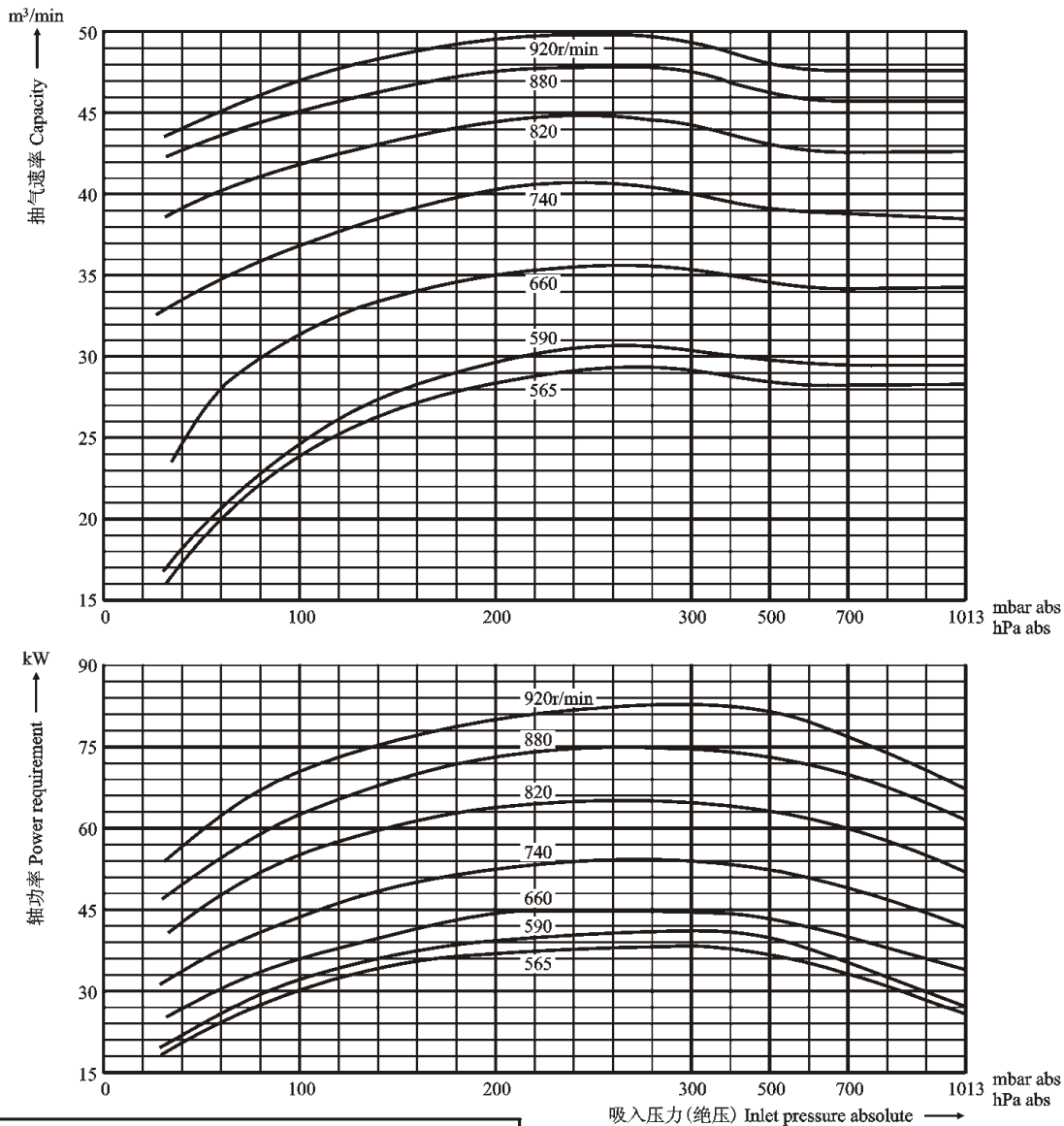
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10%.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(九) HBE253性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
920	6.5~7.8	4.3~4.7	2.2~2.4
880	6.5~7.5	4.1~4.5	2.0~2.3
820	5.8~7.4	3.8~4.2	1.9~2.1
740	5.2~6.3	3.4~3.8	1.7~1.9
660	4.6~5.6	3.0~3.4	1.5~1.7
590	4.1~5.0	2.1~3.0	1.4~1.6
565	3.9~4.8	2.0~2.9	1.3~1.5

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空

气是指在对应吸入的状态下，其相对湿度为100%的湿空气)。2、性能允差±10%。3、带上P型喷射器，吸入压力可低于33mbar。

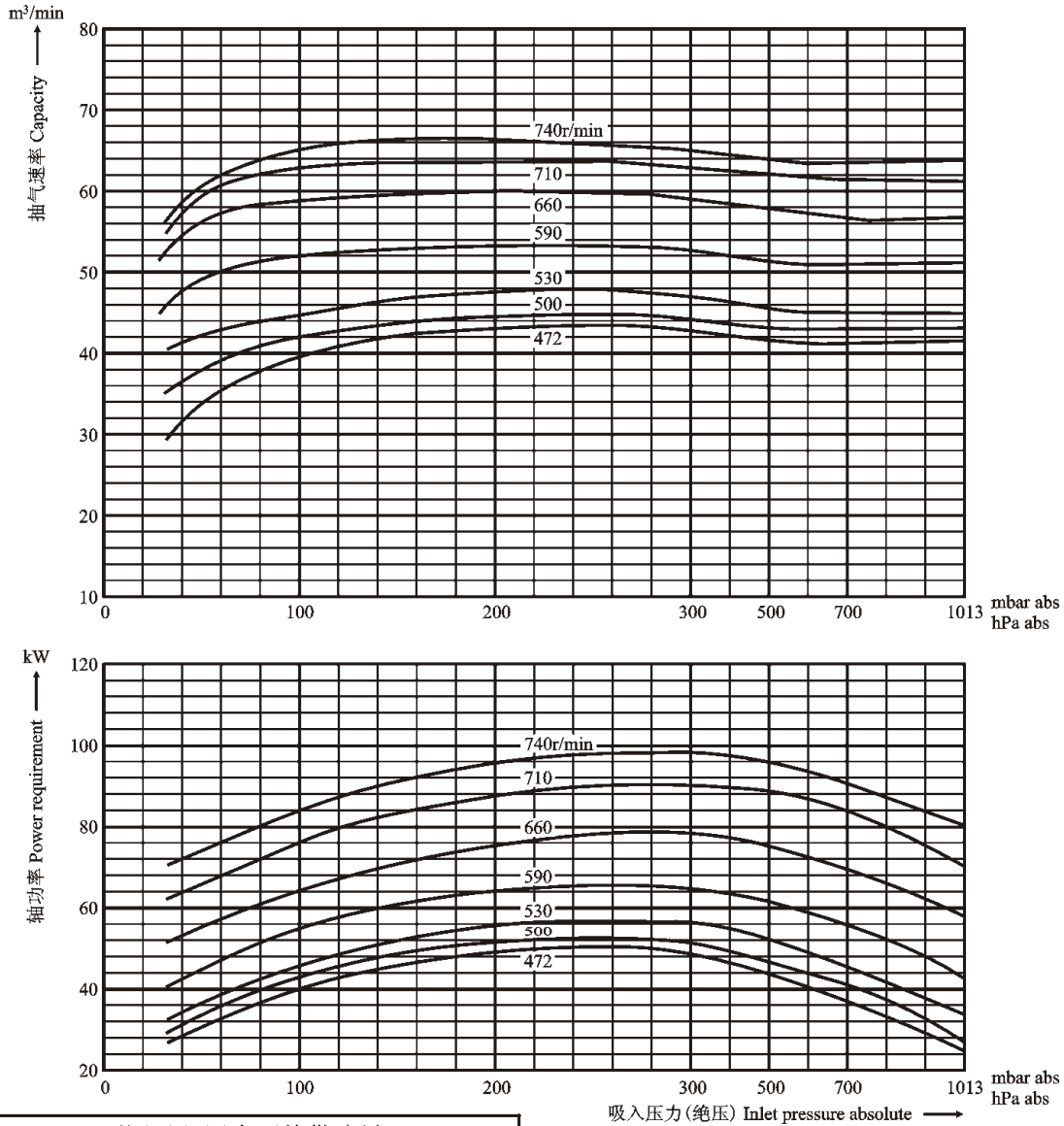
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10%.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(十) HBE303性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure		
	<200mbar m³/h	200~600mbar m³/h	>600mbar m³/h
740	9.0~10.0	7.5~8.5	3.3~4.3
710	9.0~10.0	7.0~8.0	3.2~4.2
660	8.0~9.0	6.5~7.5	2.9~3.9
590	7.8~8.0	5.8~6.8	2.6~3.6
530	6.5~7.5	5.3~6.3	2.0~3.0
500	6.0~7.0	5.0~6.0	2.2~3.2
472	5.8~6.8	4.5~5.5	2.1~3.1

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空

气是指在对应吸入的状态下，其相对湿度为100%的湿空气)。2、吸入压力≥80mbar时，性能允差±5%。3、带上P型喷射器，吸入压力可低于33mbar。

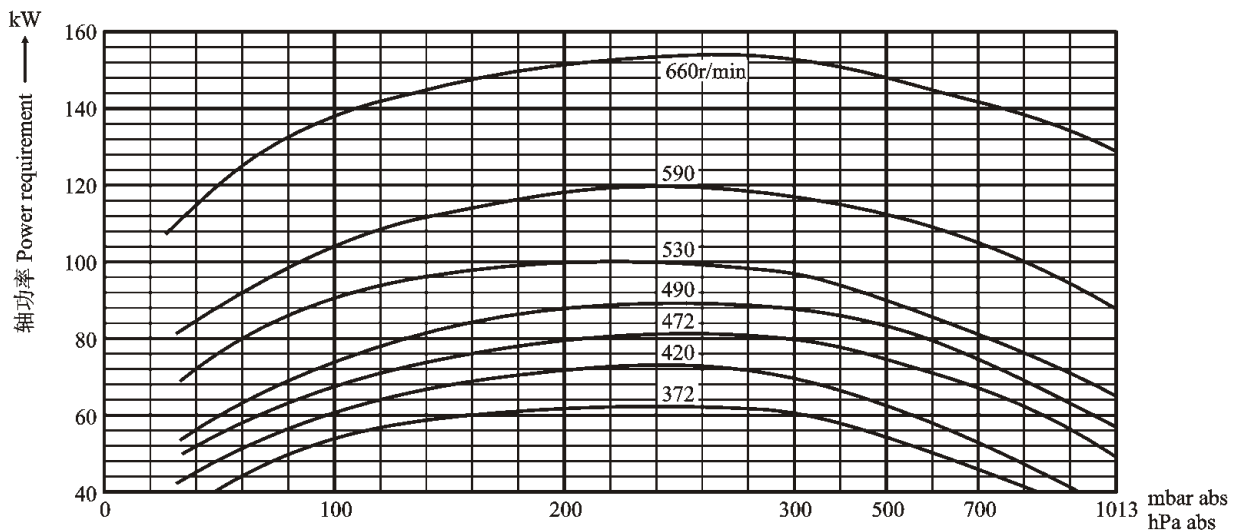
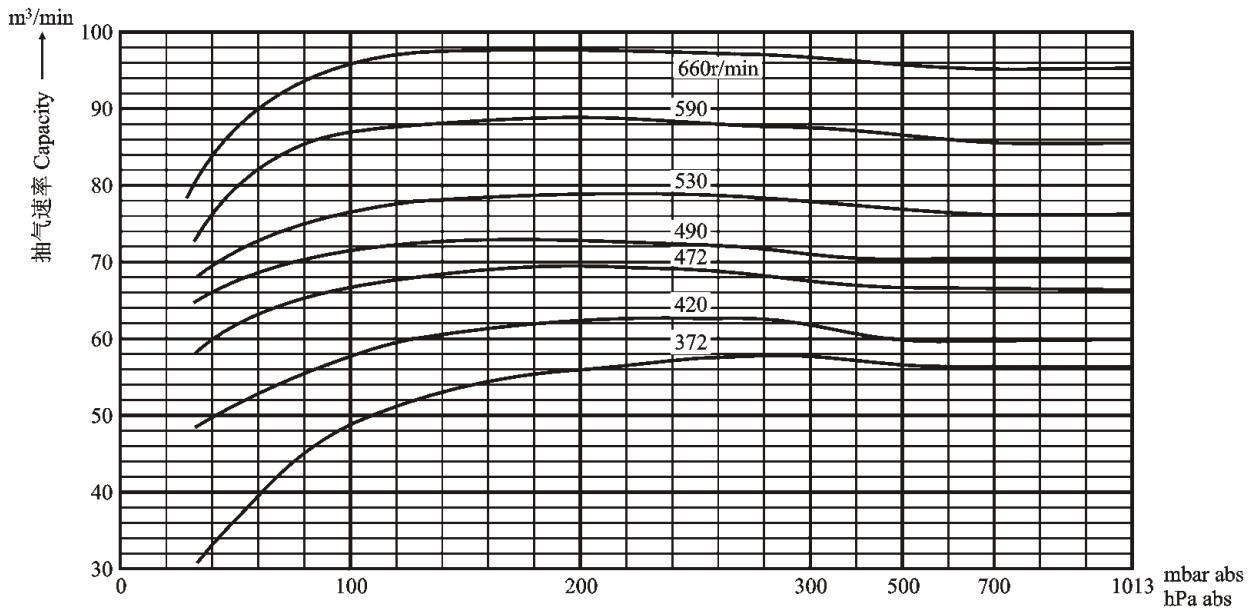
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 5% for inlet pressure ≥80mbar.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(十一) HBE353性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure			
	<200mbar m³/h	200~400mbar m³/h	400~600mbar m³/h	>600mbar m³/h
660	13.5~14.5	11.0~12.0	9.0~10.0	4.5~5.5
590	12.0~13.0	9.5~10.5	8.5~9.5	4.0~.0
530	11.0~12.0	8.5~9.5	7.0~8.0	3.5~4.5
490	10.5~11.5	8.0~9.0	6.5~7.5	3.0~.0
472	9.9~10.5	7.5~8.5	6.0~7.0	2.8~3.8
420	8.5~9.5	6.5~7.5	5.5~6.5	2.5~3.8
372	7.5~8.5	6.0~7.0	5.0~6.0	2.0~3.0

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注: 1、上述性能基于进气温度20℃, 进水温度15℃, 排气压力1013mbar的条件, 被吸入气体为饱和空气(饱和空

吸入压力(绝压) Inlet pressure absolute →

气是指在对应吸入的状态下, 其相对湿度为100%的湿空气)。2、吸入压力≥80mbar时, 性能允差±5%。

3、带上P型喷射器, 吸入压力可低于33mbar。

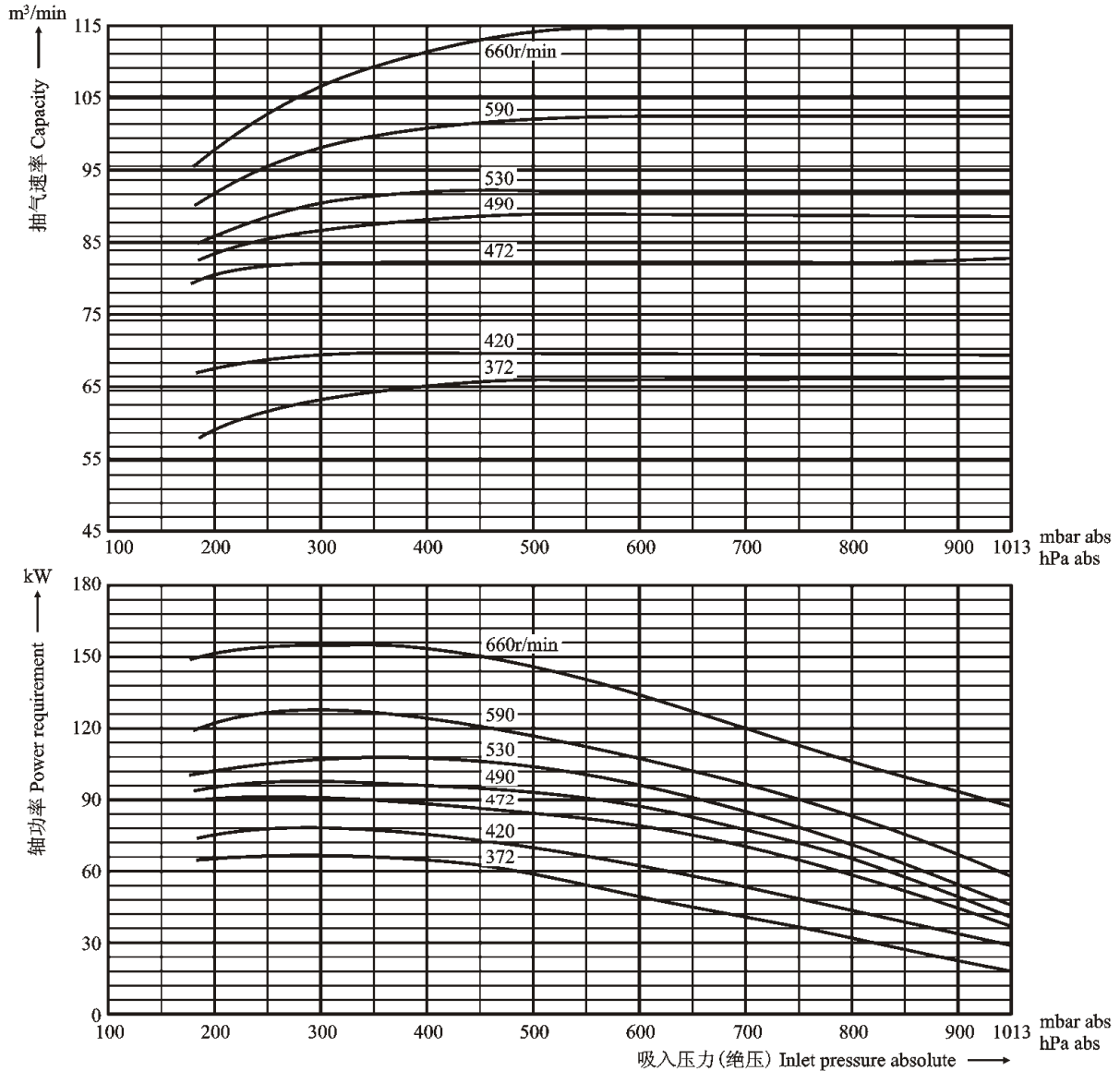
Notes:

1.These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2.The tolerance about capacity and power requirement should be in range of 5% for inlet pressure ≥80mbar.

3.Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(十二) HBE355性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure			
	<200mbar m³/h	200~400mbar m³/h	400~600mbar m³/h	>600mbar m³/h
660	13.0~14.0	11.0~13.0	8.5~11.0	5.0~6.0
590	11.5~12.5	9.0~11.5	7.5~9.0	4.5~4.5
530	10.5~11.5	9.0~11.0	7.0~9.0	4.0~5.0
490	10.0~11.0	8.5~10.5	6.5~8.5	3.8~4.8
472	9.0~10.0	8.0~10.0	6.0~8.0	3.5~4.5
420	8.0~9.0	7.0~9.0	5.0~7.0	3.0~4.0
372	7.0~8.0	6.0~8.0	4.0~6.0	2.5~4.0

气压力1013mbar的条件, 被吸入气体为饱和空气(饱和空气是指在对应吸入的状态下, 其相对湿度为100%的湿空气)。

2、吸入压力≥160mbar时, 性能允差±5%。

Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20°C, operating water at a temperature of 15°C, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

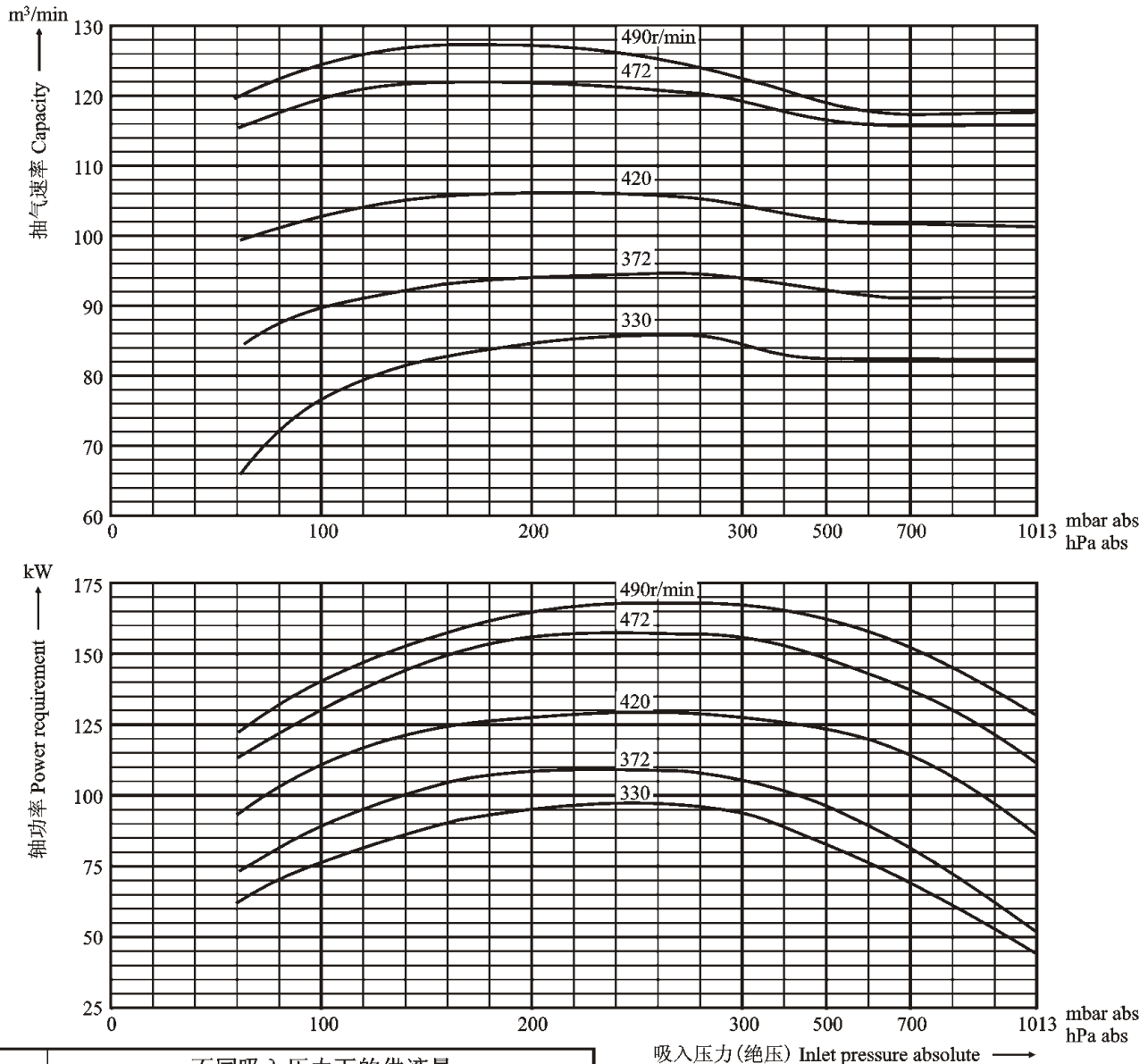
2. The tolerance about capacity and power requirement should be in range of 5% for inlet pressure ≥160mbar.

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注: 1、上述性能基于进气温度20℃, 进水温度15℃, 排

(十三) HBE403性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure			
	<200mbar m³/h	200~400mbar m³/h	400~600mbar m³/h	>600mbar m³/h
490	19.0~20.0	15.5~16.5	13.0~14.0	6.5~7.5
472	17.5~18.5	14.0~15.0	11.5~12.5	5.5~6.5
420	15.5~16.5	12.5~13.5	10.0~11.0	5.0~6.0
372	13.5~14.5	11.0~12.0	9.0~10.0	4.5~5.5
330	12.0~13.0	9.5~10.5	8.0~9.0	4.0~5.0

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空气是指在对应吸入的状态下，其相对湿度为100%的湿空气)。

2、吸入压力≥80mbar时，性能允差±5%。

3、带上P型喷射器，吸入压力可低于33mbar。

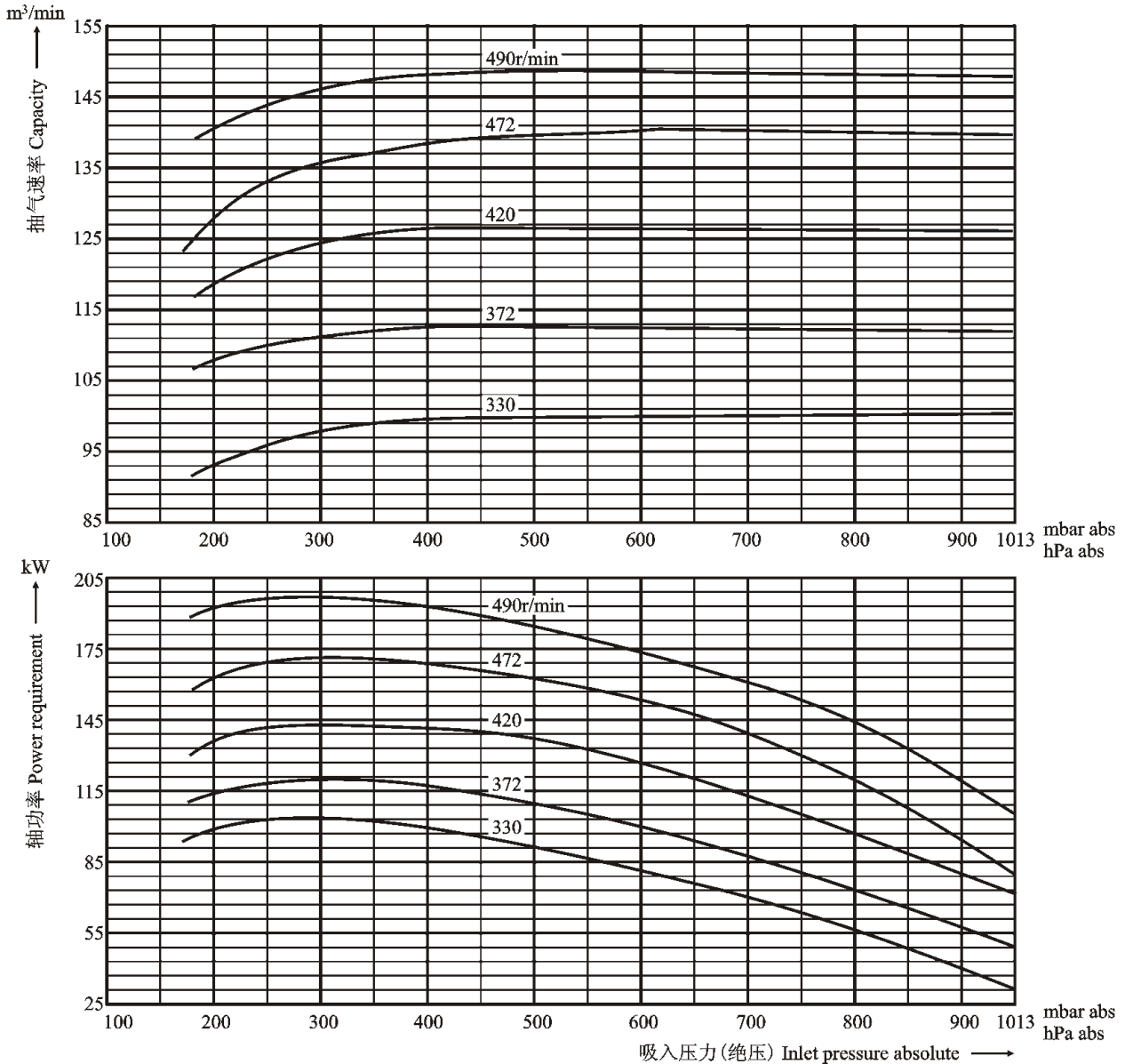
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 5% for inlet pressure ≥80mbar.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(十四) HBE405性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure			
	<200mbar m³/h	200~400mbar m³/h	400~600mbar m³/h	>600mbar m³/h
490	16.5~17.5	14.7~16.6	10.8~14.7	7.5~10.8
472	16.0~17.0	14.2~16.0	10.3~14.2	6.7~10.3
420	14.5~15.0	12.6~14.5	9.2~12.6	5.9~9.2
372	12.8~13.5	11.2~12.5	8.1~11.2	5.3~8.1
330	11.5~12.0	9.9~11.5	7.2~9.9	4.7~7.2

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注：1、上述性能基于进气温度20℃，进水温度15℃，排气压力1013mbar的条件，被吸入气体为饱和空气(饱和空

气是指在对应吸入的状态下，其相对湿度为100%的湿空气)。

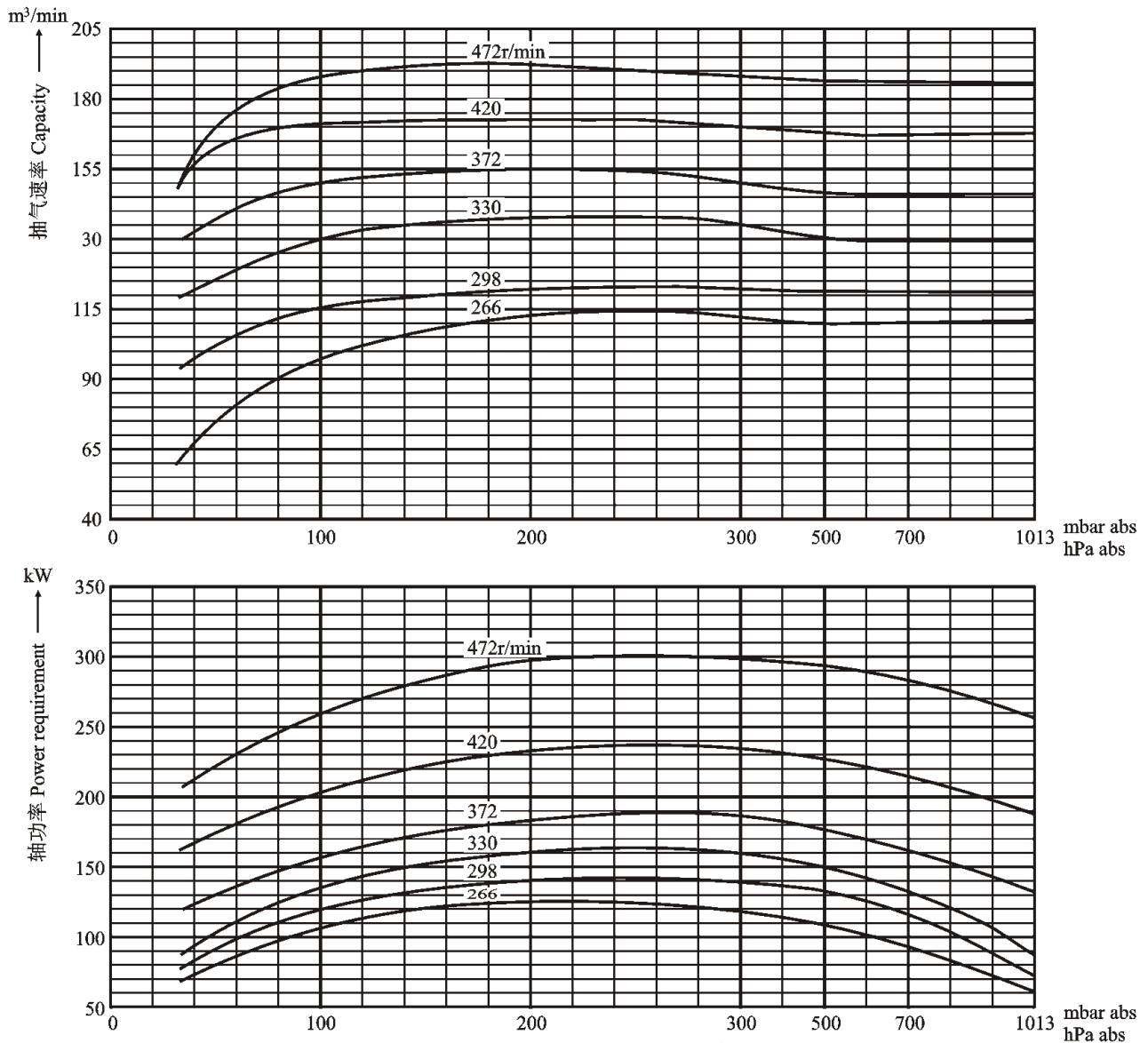
2、吸入压力≥160mbar时，性能允差±10%。

Notes:

1.These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2.The tolerance about capacity and power requirement should be in range of 10% for inlet pressure ≥160mbar.

(十五) HBE503性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure			
	<200mbar m³/h	200~400mbar m³/h	400~600mbar m³/h	>600mbar m³/h
472	22.1~22.6	19.2~22.1	14.1~9.2	9.0~14.1
420	19.3~20.1	17.1~19.6	12.5~17.1	7.9~12.5
372	17.1~17.8	15.2~17.1	11.1~15.2	7.1~11.1
330	15.4~15.8	13.4~15.4	9.9~13.4	5.9~9.9
298	13.8~14.2	12.1~13.8	8.9~12.1	5.7~8.9
266	12.4~12.8	10.9~12.4	7.9~10.9	5.1~7.9

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注: 1、上述性能基于进气温度20℃, 进水温度15℃, 排气压力1013mbar的条件, 被吸入气体为饱和空气(饱和空

气是指在对应吸入的状态下, 其相对湿度为100%的湿空气)。2、吸入压力≥80mbar时, 性能允差±10%。
3、带上P型喷射器, 吸入压力可低于33mbar。

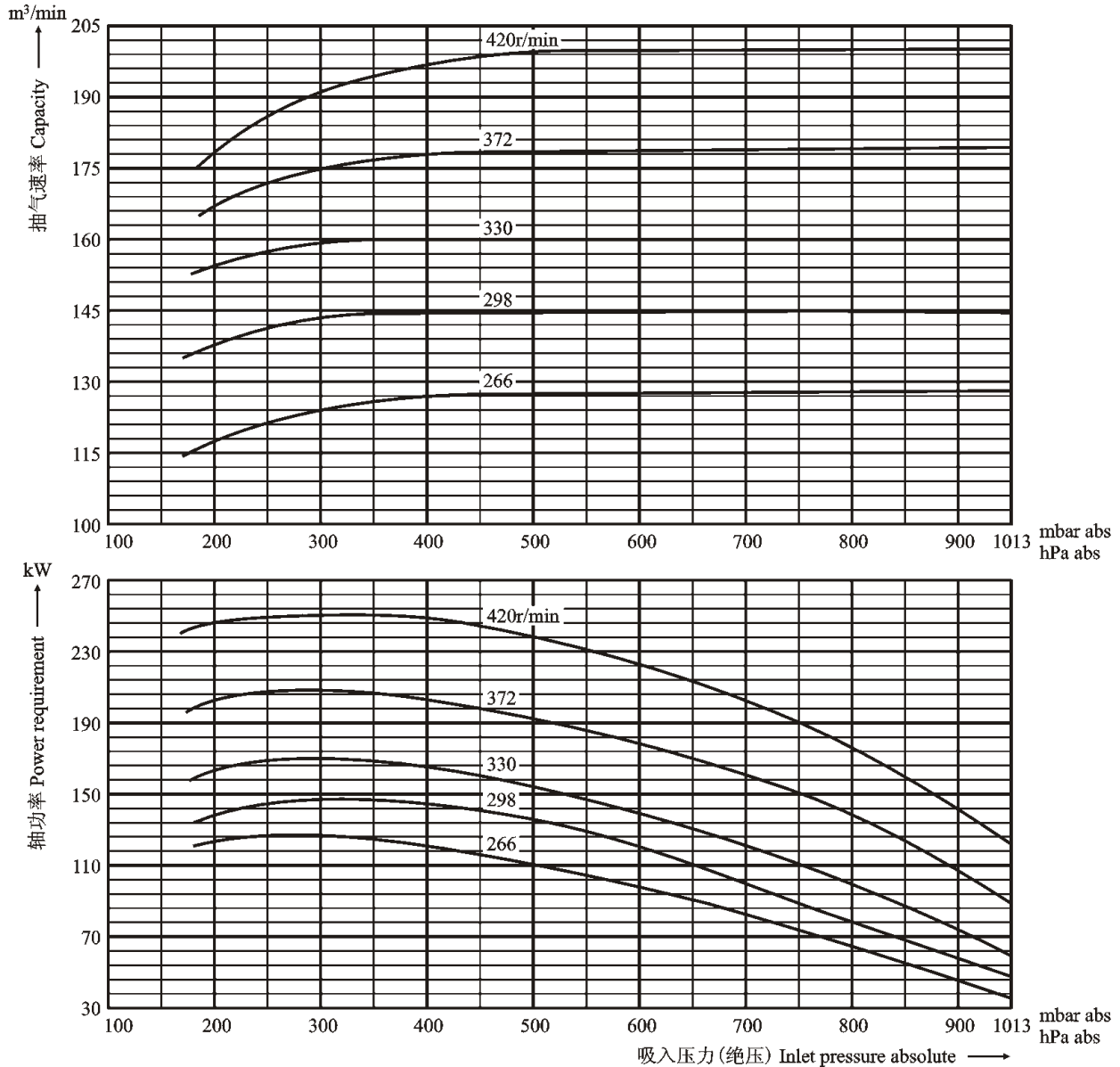
Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10% for inlet pressure ≥80mbar.

3. Air ejector of the series type P are available for suction pressures which are less than 33mbar.

(十六) HBE505性能曲线 Performance curves



转速 Speed r/min	不同吸入压力下的供液量 Operating liquid(water) at various inlet pressure			
	<200mbar m³/h	200~400mbar m³/h	400~600mbar m³/h	>600mbar m³/h
420	23.5~24.0	20.5~23.5	15.0~20.5	9.6~15.0
372	20.5~21.3	18.2~20.5	13.3~18.2	8.5~13.3
330	18.8~18.9	16.1~18.5	11.8~16.1	7.5~11.8
298	16.5~17.1	14.5~16.5	10.6~14.5	6.8~10.6
266	14.5~15.3	13.0~14.9	9.5~13.0	6.1~9.5

1hPa(百帕)=0.75Torr(托)=1mbar(毫巴)

1 Torr=1.333 hPa=1.333mbar

注: 1、上述性能基于进气温度20℃, 进水温度15℃, 排气压力1013mbar的条件, 被吸入气体为饱和空气(饱和空

气是指在对应吸入的状态下, 其相对湿度为100%的湿空气)。

2、吸入压力≥160mbar时, 性能允差±10%。

Notes:

1. These performance curves are based on operating conditions with saturated air at a temperature of 20℃, operating water at a temperature of 15℃, and discharge pressure of 1013mbar, The sucked air is saturated air (referring to the moist air with 100% of relative humidity under corresponding suctioning status).

2. The tolerance about capacity and power requirement should be in range of 10% for inlet pressure ≥ 160mbar.

八、安装和操作指导 INSTALLATION AND OPERATION INSTRUCTIONS

(一)、安装使用前, 请仔细阅读《安装、使用、维护手册》。

(二)、管道重量必须另外支撑, 泵不得承受管道的重量或其它扭力。

(三)、轴承一般采用脂润滑, 油脂量占油腔 1/3 左右。一般情况下, 轴承工作15000小时或存放2年以上启动前, 应除去旧油脂, 重上新油脂。

(四)、管路安装时, 特别是进气管路, 先清除管路焊渣、铁锈和杂物, 吸入的杂物会损坏或卡死真空泵。开车前通过供水管路向真空泵内供水, 用手盘动转子冲洗, 通过放水管路反污水排净。

(五)、对于外供水冷却方式的轴封, 泵启动前须先通冷却液, 停车时应先停车后关冷却液。

(六)、如果在真空泵起动前, 被抽系统已形成真空, 泵起动前, 进口阀门应处在关闭状态, 起动泵后, 当管路真空达到系统预定值时, 才慢慢打开进口阀门。

(七)、如果被抽吸的是易燃、易爆、有毒或要回用的气体, 则要调节筒式气水分离器的密封液位, 使液位处于液位计的中间位置, 防止气体泄漏。

(八)、起动时要核对泵体内应具备的正确起动水位, 防止泵体内满液起动或无液起动。

1. Study installation and maintenance manual prior to procedure of installation and operation.

2. The pipe must be supported independently to prevent the pump from bearing any strain and the weight of the pipeline.

3. Bearing generally use grease lubrication, oil accounts for 1/3 of the oil cavity. Under normal circumstances, after working for 15,000 hours or storing for more than two years, bearings should remove the old grease, wipe the new oil before the start.

4. When installing the pipeline, especially the suctioning pipe, first clear the pipe welding slag, rust and debris. Fill water into the pump through water supply pipeline, clean the rotor while rotating it, and discharge the water through drainage pipeline.

5. When external water supply way is adopted, pump should be connected with cooling water before operating, and be shut down before cut off the cooling water.

6. If the pumped system has been vacuum before start, the inlet valve should be closed, after the start, the valve is slowly opened.

7. If the suctioning gas is flammable, explosive, toxic or to be recycled, the liquid level of the air water separator should be adjusted to the middle of the Liquid Indicator, to prevent the gas leakage.

8. Check the water level in the casing when starting, to prevent full of liquid or no liquid in the casing.

九、订货须知 NOTICE TO ORDER

(一)、电机功率通常采用性能曲线的配套功率，用户有特殊要求或作为压缩机用时，请与公司研发中心联系。

(二)、订货时请详细提供泵工件条件信息：

介质：输送介质；工作液介质。

压力：进口压力或进口极限压力；出口压力。

流量：最大进口流量或工作条件下标态流量。

温度：输送介质温度；工作液温度。

运转方式：连续或间断。

对管路系统、传动方式和轴封形式有特别要求的，也应在订货时提出或与公司研发中心商确。

(三)、保修条款只有在使用本公司原厂备件时才有法律效力。

1.The electrical power usually adopts the matching power of performance curves, when users have special requirements, please contact the company R & D center.

2.Ordering please provide the following information:

Medium : name, working liquid medium..

Pressure: Inlet pressure or inlet limited pressure, outlet pressure.

Capacity: The largest inlet capacity or standard capacity under working conditions.

Temperature: medium temperature, working liquid temperature.

Running type: Continuous or intermittent.

Requirements on the pipeline system, transmission type and sealing types methods should be specified when ordering.

3.Warranty is valid only when genuine spare parts of our company are used.

主要产品系列

ÍJ 化工流程泵
AŽ 浆泵
ÁLT 立式化工通道泵
ÁJD 化工多级泵
ÁPA/ÁPB 石油化工流程泵
ÁZW 轴流泵
ÍFK 氟塑料泵
ÁY 化工液下泵
MÁT 轻型渣浆泵
ÁZJ 重型渣浆泵
ÁYM 液下渣浆泵
ÁGD 石灰石石膏脱硫泵
ÁBE 液环真空泵
ÁW 化工混流泵
MŠD 中开多级泵
ÁYD 液下多级泵
ÁRY 高温熔盐泵
ÍP 石化流程泵
ÁBR 工业软管泵

MAIN PRODUCT SERIES

ÍJ Chemical process pump
AŽ Pulp pump
ÁLT Vertical chemical process pump
ÁJD Chemical multi-stage pump
ÁPA/ÁPB Petrochemical process pump
ÁZW Axial-flow pump
ÍFK Plastic pump
ÁY Chemical submerged pump
MÁT Light-duty slurry pump
ÁZJ Heavy-duty slurry pump
ÁYM Submerged slurry pump
ÁGD Pump for flue gas desulfurization
ÁBE Liquid ring vacuum pump
ÁW Chemical mixed-flow pump
MŠD Split multistage pump
ÁYD Submerged multistage pump
ÁRY High temperature liquid salts pump
ÍP Petrochemical process pump
ÁBR Industry hose pump

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