

ELTON® 埃尔顿

气动隔膜泵

Air-operated Diaphragm Pump



## ELTON® 埃尔顿气动隔膜泵

ELTON埃尔顿气动隔膜泵品质优异，性能卓越，在各种应用场合均能平稳、安全、可靠的输送介质。具有简单、高可靠设计的空气换向阀，使整个隔膜泵系列产品在各种应用工况下实现相对的可靠性。气阀体采用三向先导阀，部件可以在不打开流体腔的情况下进行更换，即使在较低的压缩空气下，气阀也无需任何润滑启动。可根据客户使用要求和应用场合选择不同材质的泵体、阀球、膜片，以较合理、性价比较高的解决方案！

ELTON埃尔顿气动隔膜泵不但可以输送高磨损性、高腐蚀性介质，也可以输送高粘度或含颗粒的介质。

ELTON pneumatic diaphragm pump has excellent quality and excellent performance. It can be smoothly, safely and reliably transported in various applications. With a simple, highly reliable design of air change valve, the entire diaphragm pump series of products in various application conditions to achieve maximum reliability. The valve body adopts a three-way pilot valve. The parts can be replaced without opening the fluid cavity. Even under the lower compressed air, the valve does not need any lubrication start. According to customer use requirements and applications to select different materials of pump body, Valve ball, diaphragm, to more reasonable and cost-effective solutions! ELTON pneumatic diaphragm pumps can not only transport highly worn and highly corrosive media, but also can transport highly viscous or granular media.



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## 产品选型 Product selection

型号意义:  
Model Meaning:

TN	X	X	X	X	X
品牌 ELTON	口径 Caliber	泵体部件 Pumping parts	阀座 Valve seat	阀球 Valve ball	膜片 Diaphragm

如: TN50PP-PP-TF-TF(口径2寸、泵体聚丙烯、阀座聚丙烯、阀球聚四氟乙烯、膜片聚四氟乙烯)  
Example: TN50PP-PP-TF-TF(Caliber is 2", Pump body is PP, Valve seat is PP, Ball valve is PTFE, Diaphragm is PTFE.)

隔膜泵 Diaphragm pump	泵进出口径 Caliber	泵体材质 Pump body material	阀座材质 Valve seat material	阀球材质 Valve ball material	膜片材质 Diaphragm material
TN	15=1/2寸	PP=聚丙烯 Polypropylene	PP=聚丙烯 Polypropylene	TF=聚四氟乙烯 Teflon	TF=聚四氟乙烯 Teflon
	20=3/4寸	AL=铝合金 Aluminum	AL=铝合金 Aluminum	SP=三道橡胶 Santoprene	SP=三道橡胶 Santoprene
	25=1寸	SS=304不锈钢 304 Stainless Steel	SP=三道橡胶 Santoprene	SS=304不锈钢 304 Stainless Steel	VT=氟橡胶 Fluorine rubber
	40=1.5寸	LL=316不锈钢 316 Stainless Steel	SS=304不锈钢 304 Stainless Steel	LL=316不锈钢 316 Stainless Steel	PU=聚氨酯 polyurethane
	50=2寸	CI=球墨铸铁 nodular cast iron	LL=316不锈钢 316 Stainless Steel	BN=丁腈橡胶 Buna-N rubber	BN=丁腈橡胶 Buna-N rubber
		KY=聚偏氟乙烯 PVDF	KY=聚偏氟乙烯 PVDF		

## 材质与适用温度 Material and applicable temperature

密封圈与隔膜:  
Sealing ring and diaphragm:

氟橡胶 (Viton) .....	-40	F (-40 °C)	350	F (176.6 °C)
特氟龙 (PTFE) .....	40	F (4.4 °C)	350	F (176.6 °C)
三道橡胶 (Santoprene) .....	-40	F (-40 °C)	300	F (148.8 °C)
丁腈橡胶 (Buna-N) .....	-40	F (-40 °C)	250	F (121 °C)
聚氨酯 (Polyurethane) .....	-40	F (-40 °C)	200	F (93.3 °C)

流体腔:  
Fluid chamber:

聚丙烯 (PP) .....	40	F (4.4 °C)	150	F (65.5 °C)
聚偏氟乙烯 (PVDF) .....	40	F (4.4 °C)	200	F (93.3 °C)

# ELTON气动隔膜泵零部件材质特性及选配

## Material characteristics and selection of components for ELTON

<b>铝合金 (Aluminum)</b>	适用于气动马达和流体腔,极强的抗冲击性、耐磨蚀性和耐热性,中等抗化学腐蚀性,除不能用于HHCs流体外,通用性好。 Suitable for pneumatic motor and fluid cavity, strong impact resistance, wear resistance and heat resistance, medium resistance to chemical corrosion, high universality in addition to the HHCs fluid.
<b>聚偏氟乙烯 (PVDF)</b>	适用于流体腔和阀座,较强抗化学系抗挤压性、抗磨蚀性,适用于高纯度酸类。 Suitable for fluid body cavity and valve seat, strong resistance to chemical resistance, corrosion resistance, suitable for high purity acids.
<b>聚丙烯 (PP)</b>	适用于气动马达、流体腔和阀座中等抗磨蚀性、良好抗化学性通用性好,特别适合于普通的酸碱。 Suitable for pneumatic motor, fluid chamber and valve seat, moderate corrosion resistance, good chemical resistance, good versatility, especially suitable for ordinary acid and alkali.
<b>氟橡胶 (Viton)</b>	适用于隔膜、球阀和阀座,极强耐酸性,耐无铅燃料。 Applicable to the diaphragm, ball valve and valve seat, strong acid resistance, resistance to unleaded fuel.
<b>不锈钢 (Stainless Steel)</b>	适用于流体腔、阀座和球阀,极好的抗腐蚀性、抗磨蚀性,适用于水性涂料、粘性流体。 Applicable to the diaphragm, ball valve and ball seat, excellent corrosion resistance, suitable for water-based coating, viscous fluid.
<b>铸铁 (CI)</b>	适用于流体腔,良好的抗磨蚀性,非常适合压滤泥浆输出。 Applicable to flow cavity, good corrosion resistance, suitable for conveying mud filter.
<b>三道橡胶 (Santoprene)</b>	适用于隔膜、球阀和阀座,良好的抗磨蚀性、抗化学性和耐热性,不适合溶剂,可替代EPDM/EPR材质。 Suitable for diaphragm, ball valve and valve seat, good corrosion resistance, chemical resistance and heat resistance, not suitable for solvent, can replace the EPDM/EPR material.
<b>特氟龙 (PTFE)</b>	适用于隔膜、球阀和阀座,良好的抗化学性、抗溶剂性,中等抗磨蚀性,通用性强。 Suitable for diaphragm, ball valve and valve seat, good resistance to chemical, solvent resistance, medium resistance to corrosion, strong commonality.

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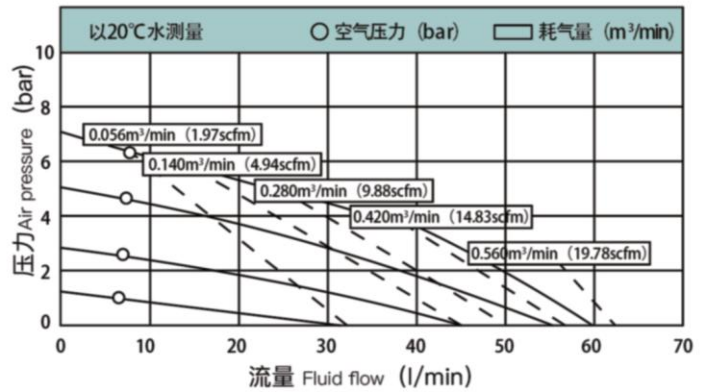
- 最大工作流体压力.....7 bar
- 工作空气压力范围.....1.8 to 7 bar
- 最大空气消耗量.....0.67 m<sup>3</sup>/min
- 最大自由流量.....57 l/min
- 最大输送固体颗粒.....2.5 mm
- 空气进口尺寸.....1/4 in
- 空气出口尺寸.....3/8 in

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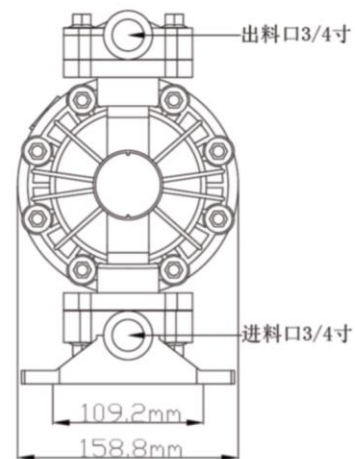
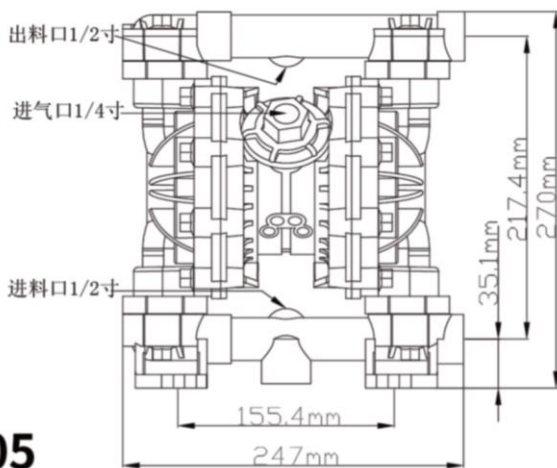
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- Air pressure range at working.....1.8 to 7 bar
- Maximum air consumption.....0.67 m<sup>3</sup>/min
- Maximum free flow.....57 l/min
- Maximum transport of solid particles.....2.5 mm
- Air inlet size.....1/4 in
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性能曲线图 Performance curves



安装尺寸图 Installation dimension drawing



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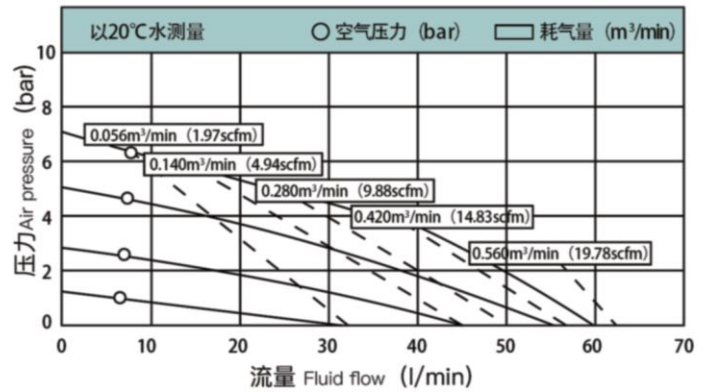
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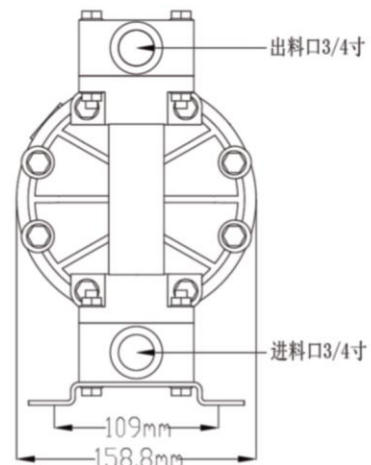
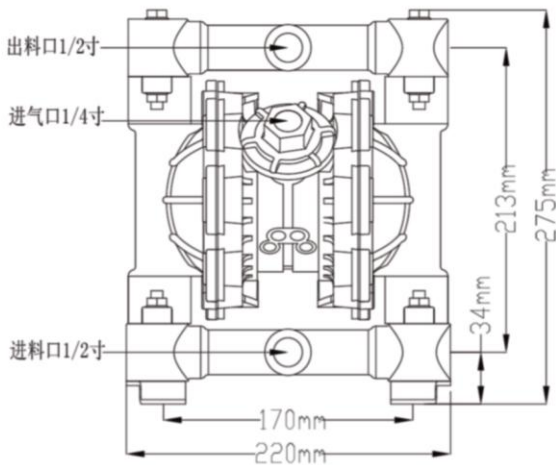
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性能曲线图 Performance curves



安装尺寸图 Installation dimension drawing

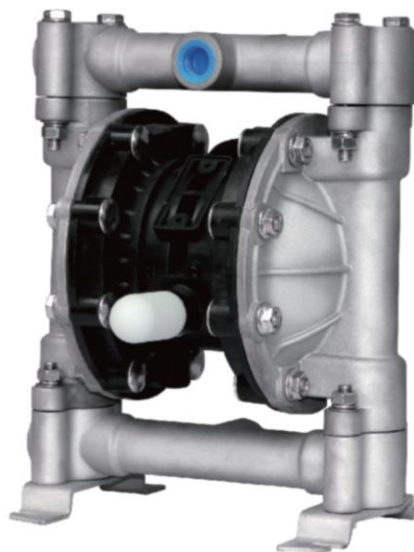


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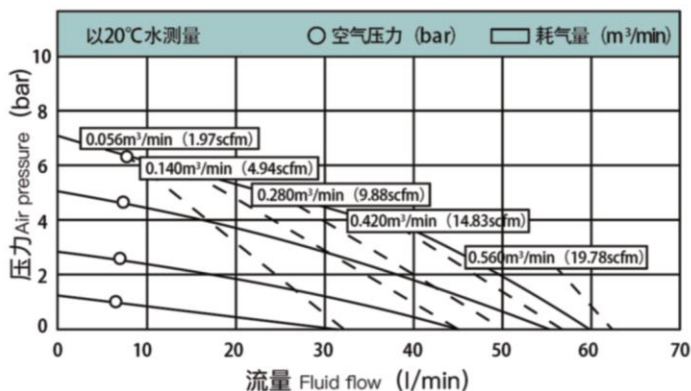
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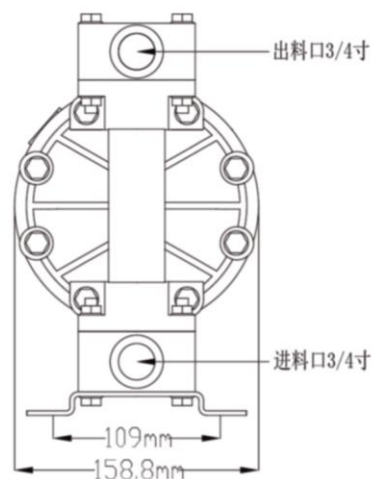
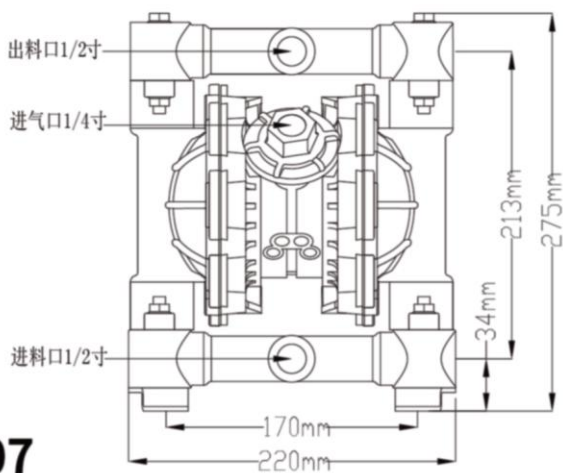
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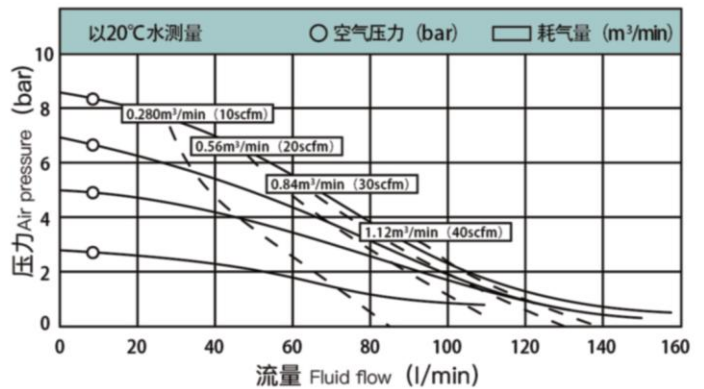
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- 工作空气压力范围.....1.4 to 8.4 bar
- 最大空气消耗量.....1.5 m<sup>3</sup>/min
- 最大自由流量.....150 l/min
- 最大输送固体颗粒.....3.2 mm
- 空气进口尺寸.....1/2 in
- 空气出口尺寸.....3/4 in



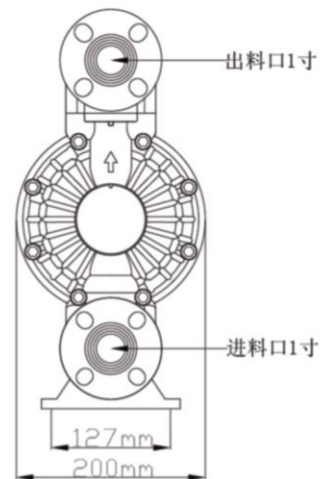
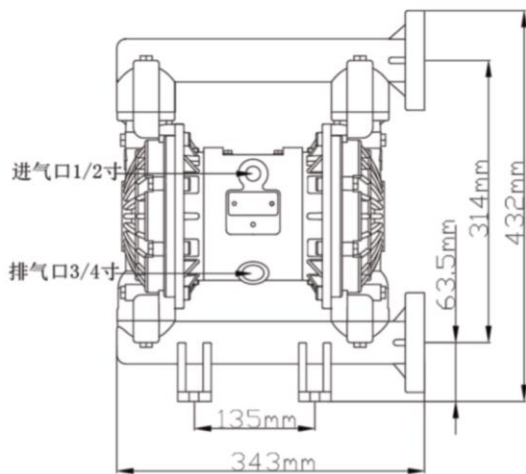
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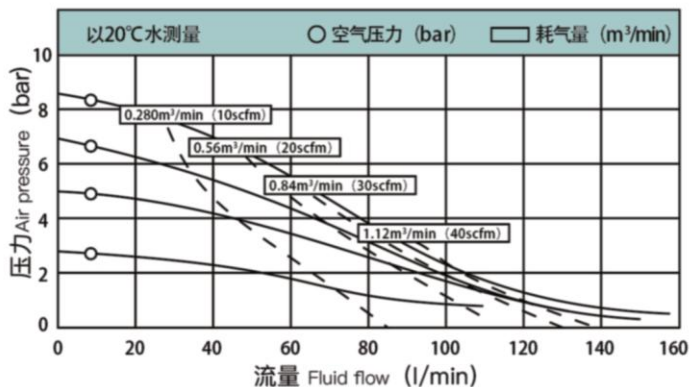
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- 空气进口尺寸.....1/2 in
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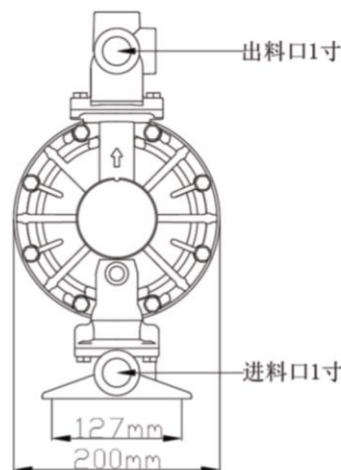
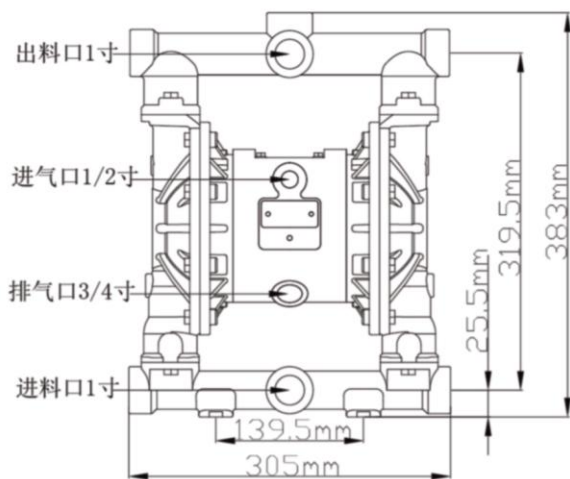
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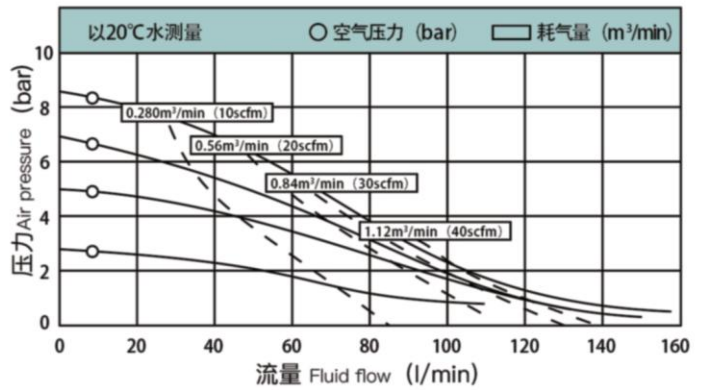
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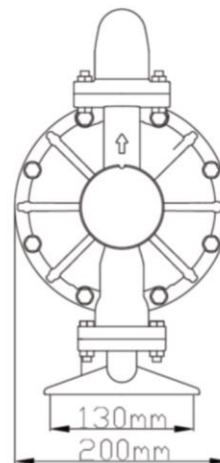
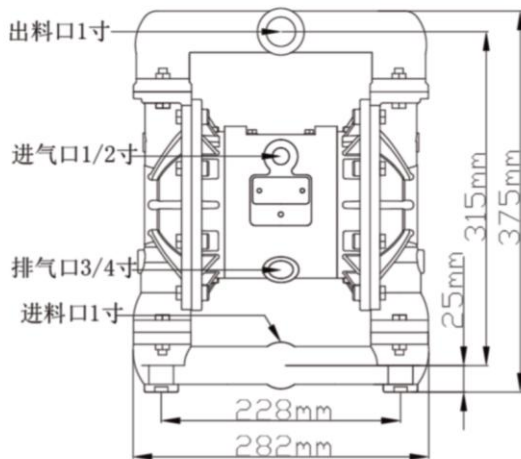
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安装尺寸图 Installation dimension drawing



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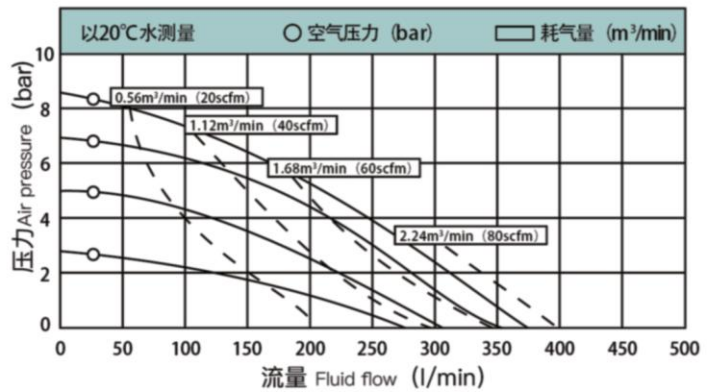
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- 最大空气消耗量.....3 m<sup>3</sup>/min
- 最大自由流量.....378 l/min
- 最大输送固体颗粒.....4.8 mm
- 空气进口尺寸.....1/2 in
- 空气出口尺寸.....3/4 in

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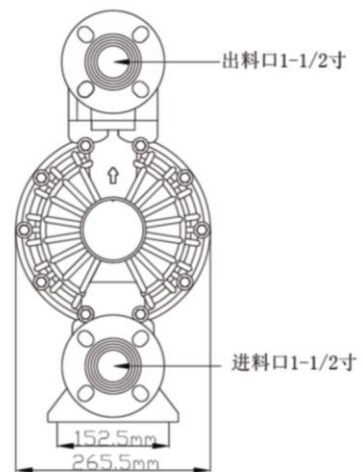
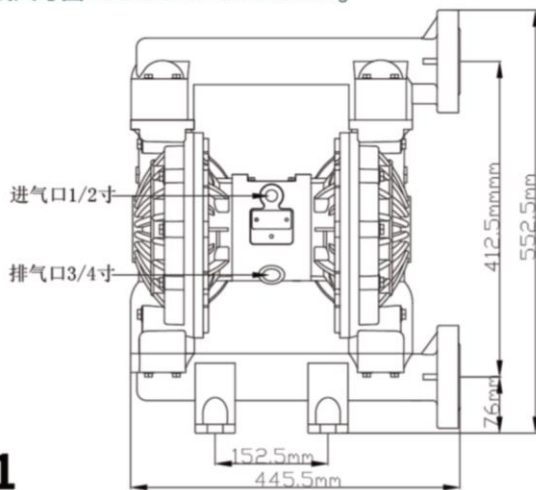
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性能曲线图 Performance curves



安装尺寸图 Installation dimension drawing



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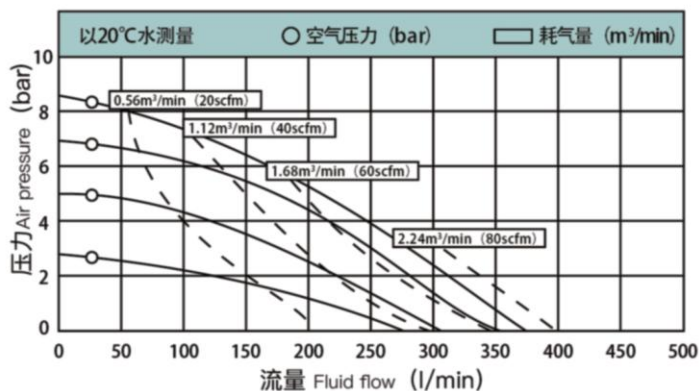
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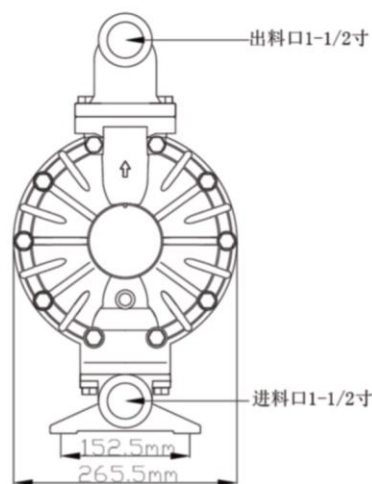
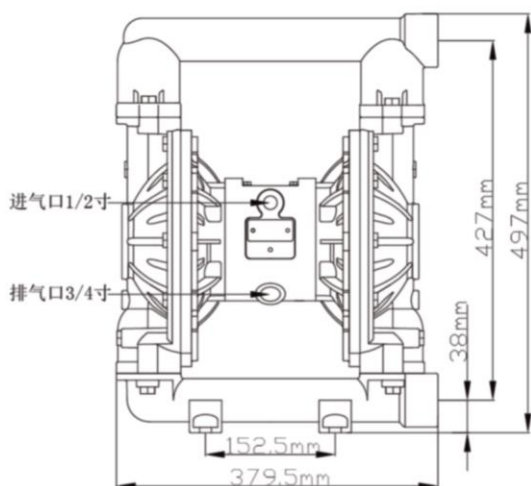
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性能曲线图 Performance curves



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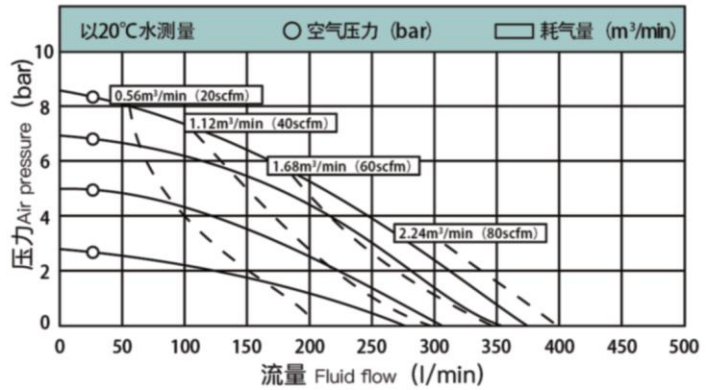
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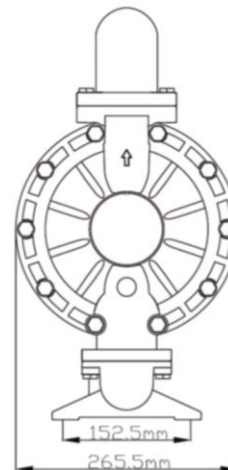
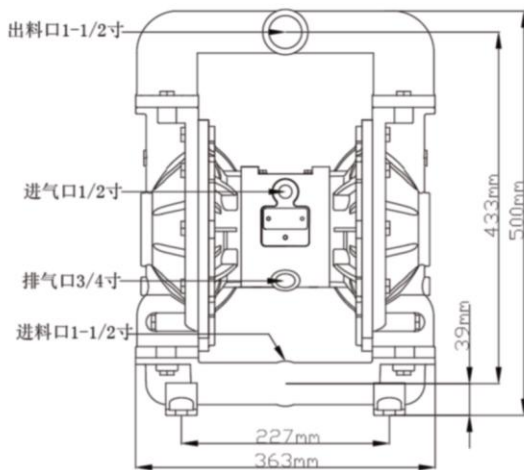
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- Maximum free flow.....378 l/min
- Maximum transport of solid particles.....4.8 mm
- Air inlet size.....1/2in
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性能曲线图 Performance curves



安装尺寸图 Installation dimension drawing



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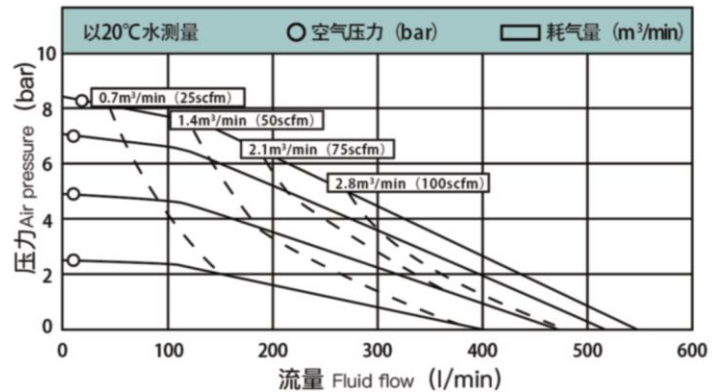
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- 最大空气消耗量.....4.2 m<sup>3</sup>/min
- 最大自由流量.....568 l/min
- 最大输送固体颗粒.....6.3 mm
- 空气进口尺寸.....1/2 in
- 空气出口尺寸.....3/4 in



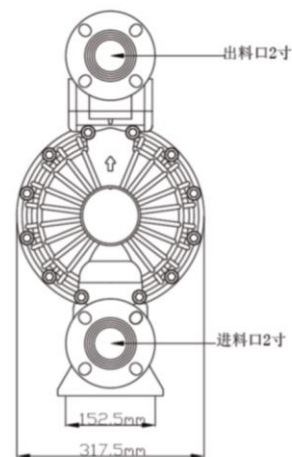
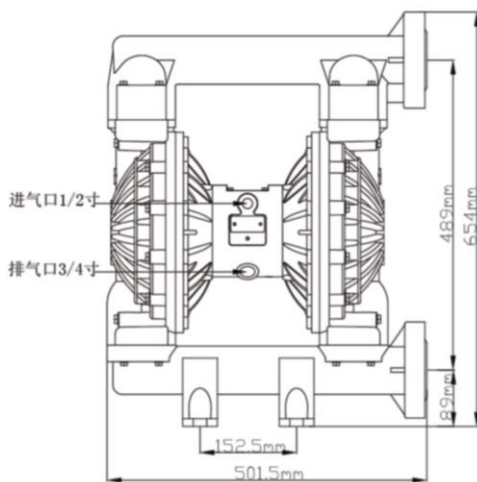
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安装尺寸图 Installation dimension drawing



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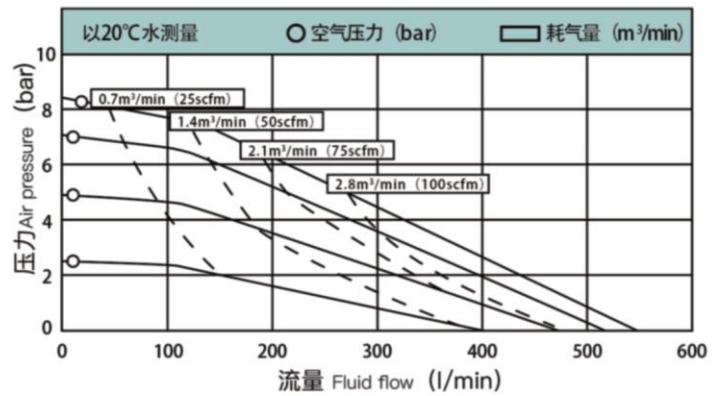
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- 最大空气消耗量.....4.2 m<sup>3</sup>/min
- 最大自由流量.....568 l/min
- 最大输送固体颗粒.....6.3 mm
- 空气进口尺寸.....1/2 in
- 空气出口尺寸.....3/4 in



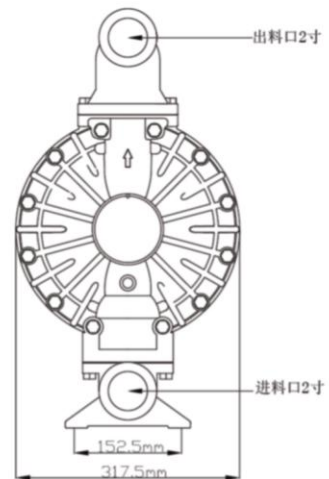
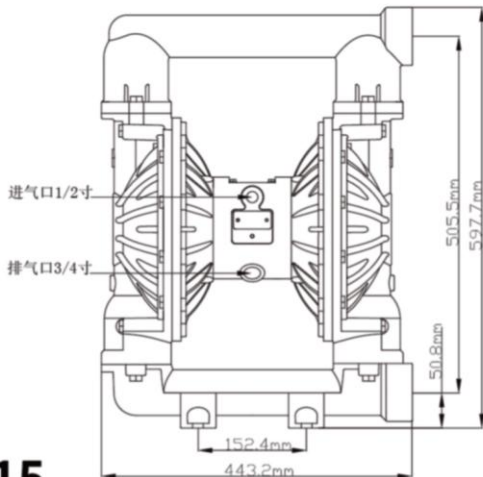
**Technical parameter:**

- Maximum working fluid pressure.....8.4 bar
- Air pressure range at working.....1.4 to 8.4 bar
- Maximum air consumption.....4.2 m<sup>3</sup>/min
- Maximum free flow.....568 l/min
- Maximum transport of solid particles.....6.3 mm
- Air inlet size.....1/2 in
- Air outlet size.....3/4 in

性能曲线图 Performance curves



安装尺寸图 Installation dimension drawing





**技术参数:**

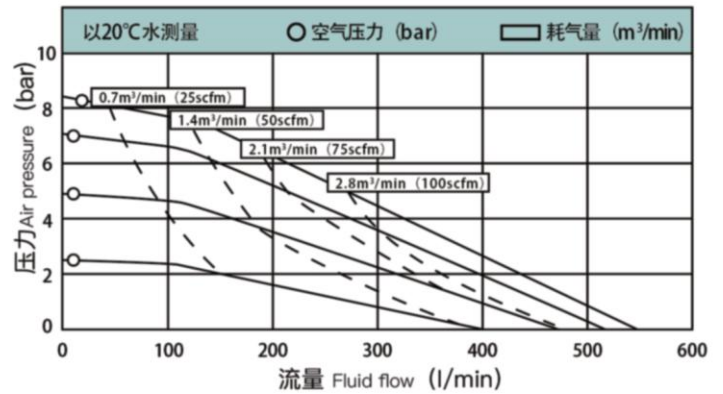
- 最大工作流体压力.....8.4 bar
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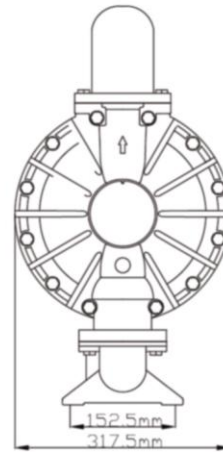
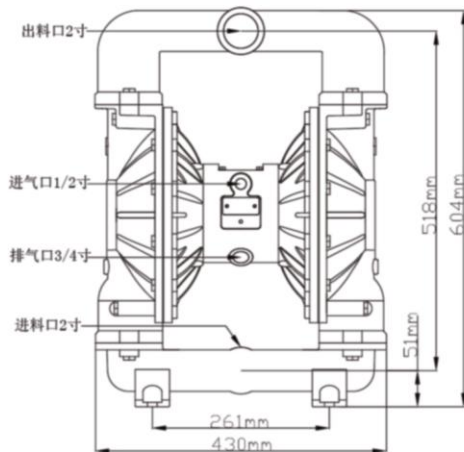
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性能曲线图 Performance curves

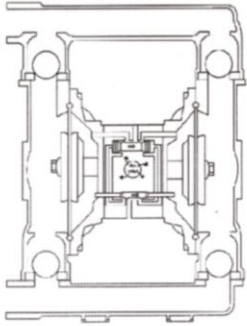


安装尺寸图 Installation dimension drawing



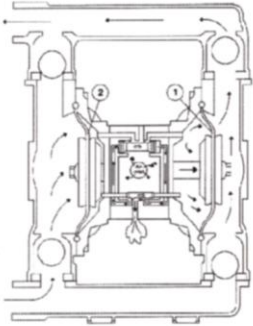
## 工作原理

1



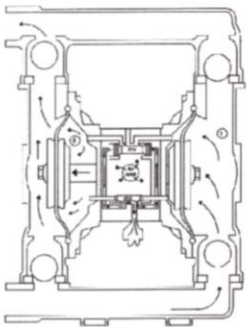
连接压缩空气后，气阀控制压缩空气推动膜片1，向右移动，同时膜片会挤压右膜腔室中的介质从而将介质排出泵腔。膜片不仅起输送介质的作用，同时在泵腔中起隔离压缩空气和介质的作用。当一个膜片被压缩空气推向远离气阀体时，于此同时通过连杆连接的另外一个膜片移向气阀体。其中处于高压中的连杆其作用是连接位于两个膜腔室中的膜片。当膜片2移向气阀体时，膜片后面的高压空气通过阀门的换向通过消声器被迫排放到外界。当膜片2移向气阀体时，泵入口产生真空并通过大气压力将介质压入泵的进口中。此时，泵的进口球阀会被抬高而离开阀座，保证介质很轻松的通过进口管路而充入泵腔中。

2



当膜片1位于高压空气下时，膜片1随着冲程慢慢的移动到最大位置。同时，通过气阀控制压缩空气慢慢充入膜片2后面的空间。此压缩空气势必将推动膜片2慢慢远离气阀体，通过连杆的连接，膜片1开始移向气阀体。膜片2将挤压膜腔室中介质并通过水力作用在进口处的球阀上，使得球阀和阀座的接触后而封闭进口管路。同时，同样的水力作用在出口处球阀上并提升球阀，打开出口管路。另一侧的出口处球阀因压力的作用而关闭，进口处的球阀同样因压力的作用而打开，液体也就被吸入泵腔室内。

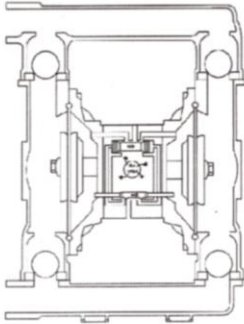
3



当一个冲程完成后，通过气阀的换向使得膜片1后面再次被充入压缩空气，同时膜片2开始移向气阀体，膜片2后面的气体也开始通过气阀及消声器排出外界。

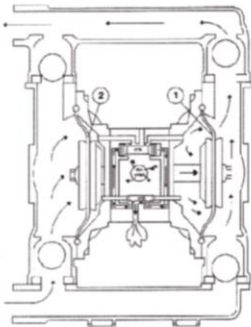
## Operating Principle

1



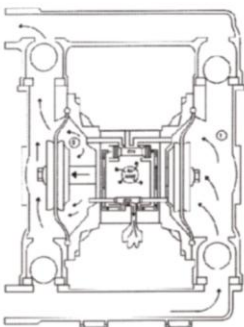
The air valve directs pressurized air to the back side of diaphragm A. The compressed air is applied directly to the liquid column separated by elastomeric diaphragm. The diaphragm acts as a separation membrane between the compressed air and liquid, balancing the load and removing mechanical stress from the diaphragm. The compressed air moves the diaphragm away from the center block of the pump. The opposite diaphragm is pulled in by the shaft connected to the pressurized diaphragm. Diaphragm B is on its suction stroke; air behind the diaphragm has been forced out to the atmosphere through the exhaust port of the pump. The movement of diaphragm B toward the center block of the pump creates a vacuum within chamber B. Atmospheric pressure forces fluid into the inlet manifold forcing the inlet valve ball off its seat. Liquid is free to move past the inlet valve ball and fill the liquid chamber.

2



When the pressurized diaphragm, diaphragm A, reached the limit of its discharge stroke, the air valve redirects pressurized air to the back side of diaphragm B. The pressurized air forces diaphragm B away from the center block while pulling diaphragm A to the center block. Diaphragm B is now on its discharge stroke. Diaphragm B forces the inlet valve ball onto its seat due to the hydraulic forces developed in the liquid chamber and manifold of the pump. These same hydraulic forces lift the discharge valve ball off its seat, while the opposite discharge valve ball is forced onto its seat, forcing fluid to flow through the pump discharge. The movement of diaphragm A toward the center block of the pump creates a vacuum within liquid chamber A. Atmospheric pressure forces fluid into the inlet manifold of the pump. The inlet valve ball is forced off its seat allowing the fluid being pumped to fill the liquid chamber.

3



At completion of the stroke, the air valve again redirects air to the back side of diaphragm A, while starts diaphragm B on its exhaust stroke. As the pump reached its original starting point, each diaphragm has gone through one exhaust and one discharge stroke. This constitutes one complete pumping cycle. The pump may take several cycles to completely prime depending on the conditions of the application.

## **ELTON气动隔膜泵已广泛应用于以下领域**

**ELTON Pneumatic diaphragm pump has been widely used in the following fields**

**化工业：酸、碱、溶剂、悬浮物、分散体等..**

Chemical industry: acids, bases, solvents, suspensions, dispersants, etc..

**涂料业：树脂、溶剂、着色剂、清洗剂、油漆等..**

Paint industry: resin, solvent, colorant, cleaning agent, paint, etc..

**石化业：原油、稠油、油脂、泥浆、污泥等..**

Petrochemical industry: crude oil, heavy oil, grease, mud, sludge, etc..

**水处理：石灰浆、污水、化学品、废水等..**

Water treatment: lime pulp, sewage, chemicals, wastewater, etc..

**饮料业：酵母、糖浆、红酒、水果汁、玉米糖浆等..**

Beverage industry: yeast, syrup, red wine, juice, corn syrup, etc..

**医药业：溶剂、酸、碱、植物提炼液、血浆等各类药品料液等..**

Pharmaceutical industry: Solvent, acid, alkali, plant extract, plasma and other kinds of pharmaceutical materials..

**电子业：溶剂、电镀液、清洗液、硫酸、硝酸、腐蚀性酸、酸性废水等..**

Electronic industry: solvent, plating liquid, cleaning liquid, sulfuric acid, nitric acid, corrosive acid, acid wastewater, etc..

**汽车业：抛光乳剂、油、冷却剂、汽车底漆、清漆、清漆添加剂等..**

Auto industry: polished emulsion, oil, coolant, car primer, varnish, varnish additives, etc..

**陶瓷业：泥浆、陶浆、石灰浆、陶土浆等..**

Ceramic industry: mud, clay pulp, lime pulp, clay pulp and so on..

**制造商：**

**上海奇穆实业有限公司**

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