

# DBY电动隔膜泵

POWER OPERATED DOUBLE DIAPHRAGM PUMPS



使用说明书

OPERATION INSTRUCTIONS

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### 概 述 Summary

电动隔膜泵是一种新型的泵类,近年来,由于在隔膜材质上取得了突破性的进展,国际上越来越多的工业化国家采用此种型式的泵,取代部份离心泵、螺杆泵,来应用于石化、陶瓷、冶金等行业,我单位目前生产的电动隔膜泵产品设计均参考美国ABEL公司样机,DBY型隔膜泵适用于低压,即出口压力 $\leq 3\text{kgf/cm}^2$ 的场合。

This electric diaphragm pump is a new kind of pumps. In recent years major breakthroughs have been made in the diaphragm materials, so more and more industrialized countries have been substituting this kind of pumps for some centrifugal and screw pumps to be applied in such industries as petrochemicals, ceramics and metallurgy. Currently all of our electric diaphragm pumps are designed with reference to prototypes of ABEL, the US. Our DBY diaphragm pumps are applicable for low pressure conditions, namely the outlet pressure  $\leq 3\text{kgf/cm}^2$ .

### 性 能 特 点 Performance and Characteristics

DBY系列电动隔膜泵具有下列特点:

- 一、不需灌引水,自吸能力达3米以上。
- 二、通过性能好,直径在10毫米以下的颗粒、泥浆等均可毫不费力地通过。
- 三、由于隔膜将被输送介质和传动机械件分开,所以介质绝对不会向外泄漏。且泵本身无轴封,使用寿命大大延长。根据不同介质,隔膜分为氯丁橡胶、氟橡胶、丁腈橡胶等,可以满足不同用户的要求。
- 四、体积小重量轻:由于采用了行星摆线传动结构,故使泵型获得小尺寸如与同类型泵来比较,其体积重量均下降一半左右。
- 五、泵体介质流经部份,可根据用户要求,分为铸铁、不锈钢、衬胶,电机分为普通式和防爆式(B3d)两种,目前该泵正应用在下列场合

DBY series of electric diaphragm pumps has the following characteristics:

- I. There is no need for water filling or diversion, and its self-priming capacity is above 3m.
- II. Its trafficability is good, and those grains, slurry or others with a diameter less than 10mm can all be passed easily.
- III. The diaphragm will be separated by the working medium and the transmission machinery, so the medium can by no means leak outwards. Besides, the pump itself has no shaft seal, so its service life is extended greatly. According to different medium types, the diaphragm can be divided into neoprene, fluorine rubber, chemigum and so on, which can meet requirements of different users completely.
- IV. Compact and light: with a planetary cycloid transmission structure, the pump can be small-size, and compared with similar pump types, both of its volume and weight are half or so.
- V. The medium flow-through part on the pump body can adopt cast iron, stainless steel, rubber lining or fluorine lining, as required by users, and the motor includes two types: common, explosion-proof(B3d). At present the pumps is being used in the following applications.

### 主 要 用 途 Main Applications

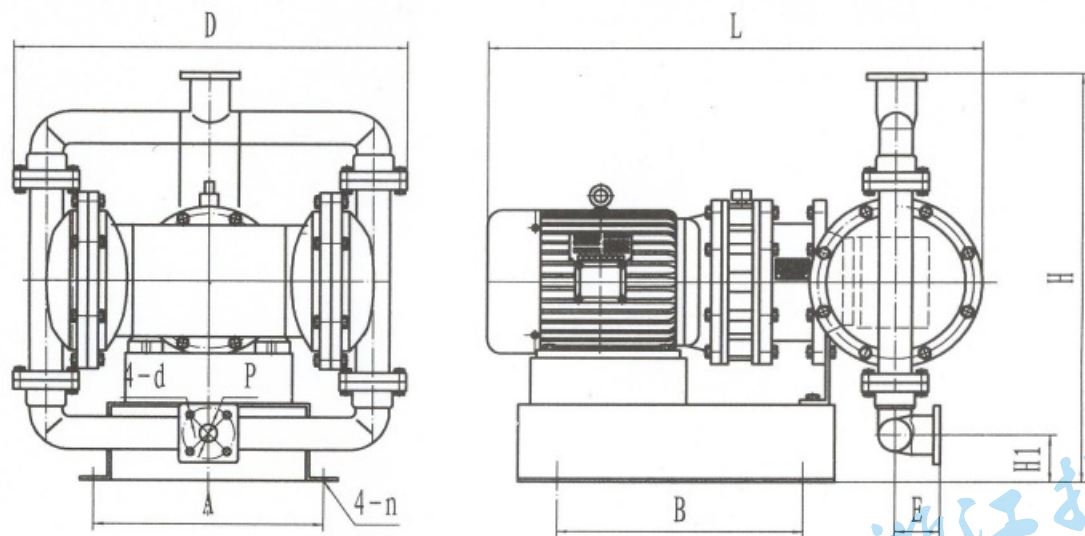
- 1、各种剧毒、易燃、易挥发液体。
- 2、各种强酸、强碱、强腐蚀液体。
- 3、可输送较高温度的介质 $150^{\circ}\text{C}$ 。
- 4、作为各种压滤机前级送压装置。
- 5、热水回收及循环。
- 6、油罐车、油库、油品装卸。
- 7、泵吸泡菜、果酱、土豆泥、巧克力等。
- 8、泵吸油漆、树胶、颜料粘合剂。
- 9、各种瓷器釉浆、水泥灌浆、灰浆、泥浆。
- 10、各种橡胶浆乳胶、有机溶剂、填料。
- 11、用泵为油轮驳船清仓吸取仓内污水及剩油。
- 12、啤酒花及发酵粉稀浆、糖浆、糖蜜。
- 13、泵吸矿井、坑道、隧道、下水道中污水、沉淀物。
- 14、各种特殊介质的吸送。

1. Different kinds of virulent, inflammable or volatile liquids.
2. Different kinds of strong acid, alkali and strong-corrosion liquids.
3. Transporting high-temperature media:  $150^{\circ}\text{C}$ .
4. To be used as a preceding pressure device for different kinds of press filters.
5. Recovery and circulation of hot water.
6. Loading and unloading of oil tankers, oil depots and oil products.
7. Pumping of pickle, jam, mashed potato, chocolate, etc.
8. Pumping of oil paint, wood gum and pigment adhesive.
9. Different kinds of porcelain glaze, cement grout, mortar and slurry.
10. Different kinds of latex, organic solvents and packing.
11. Pumping of sewage and remaining oil from cabins of oil tankers or barges for cabin emptying.
12. Hops, yeast slurry, syrup and molasses.
13. Pumping of sewage and sediment from shafts, adits, tunnels and sewer culverts.
14. Suction and transportation of different kinds of special media.

工作原理图 Working Principle Diagram

电机(4)通过减速箱(3)带动左右两端柱塞上面的隔膜(2)一前一后往复运动。在左右两个泵腔内，装有上下四个单向球阀(1)，隔膜的运动，造成工作腔内的容积的改变，迫使四个单向球阀交替地开启和关闭，从而将液体不断地吸入和排出。

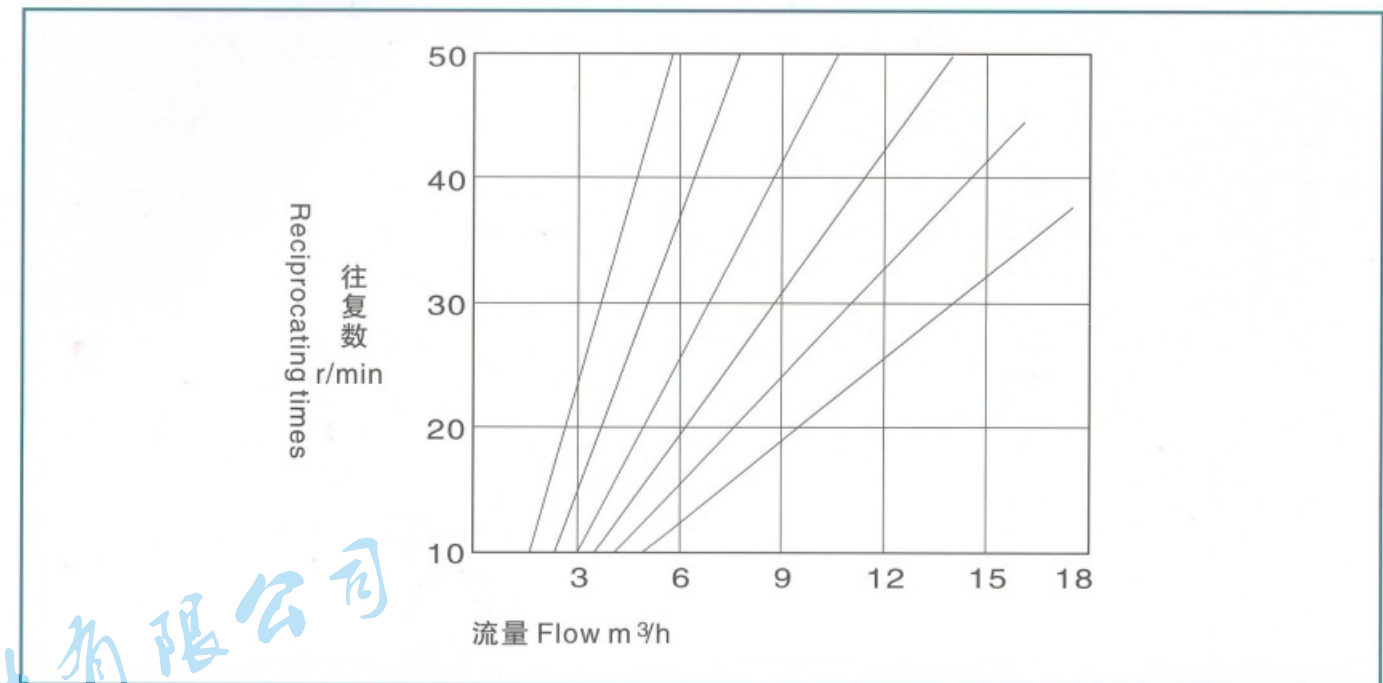
The motor (4) drives the diaphragm (3) on the plungers on left and right ends through the reducer (2) to make reciprocating motions from back to forth. Inside the left and right pump cavities, there are four upper and lower non-return ball valves (1) making motions to change volumes of the working cavities and drive the four non-return ball valves to open and close alternately, thus sucking and discharging the liquid continually.



安装尺寸与外形尺寸 Installing and Overall Dimensions

| 型号<br>Type | A   | B   | D   | 4-n  | L    | H   | H1  | E   | P   | 4-d |
|------------|-----|-----|-----|------|------|-----|-----|-----|-----|-----|
| DBY-10     | 185 | 245 | 320 | φ 12 | 500  | 275 | 50  | 40  |     |     |
| DBY-15     | 185 | 245 | 320 | φ 12 | 500  | 275 | 50  | 40  |     |     |
| DBY-25     | 260 | 335 | 455 | φ 12 | 700  | 500 | 65  | 80  | 75  | 12  |
| DBY-40     | 260 | 335 | 455 | φ 12 | 700  | 500 | 65  | 80  | 100 | 14  |
| DBY-50     | 300 | 385 | 580 | φ 14 | 850  | 670 | 95  | 120 | 110 | 14  |
| DBY-65     | 300 | 385 | 580 | φ 14 | 850  | 670 | 95  | 120 | 130 | 14  |
| DBY-80     | 410 | 480 | 690 | φ 16 | 1100 | 940 | 170 | 135 | 150 | 18  |
| DBY-100    | 410 | 480 | 690 | φ 16 | 1100 | 940 | 170 | 140 | 170 | 18  |

特性曲线图 Characteristic Curve Diagram



主要性能规格 Key Properties and Specifications

| 型号<br>Type | 流量<br>Flow<br>m³/h | 吸程<br>Suction lift<br>m | 扬程<br>Head<br>m | 出口压力<br>Outlet pressure<br>kgf/cm² | 转速/功率<br>Speed(r/min)<br>Power(kW) | 使用温度℃<br>Working temperature |                        | 泵进出口尺寸<br>Pump inlet and<br>outlet dimensions | 重量<br>Weight<br>kg | 备注<br>Remarks                                    |
|------------|--------------------|-------------------------|-----------------|------------------------------------|------------------------------------|------------------------------|------------------------|---|--------------------|--|
|            |                    |                         |                 |                                    |                                    | 铸铁<br>Cast iron              | 不锈钢<br>Stainless steel |   |                    |  |
| DBY-10     | 0.5                | 3                       | 30              | 3                                  | 1450/0.55                          | 90                           | 150                    | 3/8" 丝扣<br>3/8" Screw thread                  | 45                 | 重量以<br>铸铁为<br>标准<br>Weight is based on cast iron |
| DBY-15     | 0.75               | 3                       | 30              | 3                                  | 1450/0.55                          | 90                           | 150                    | 1/2" 丝扣<br>1/2" Screw thread                  | 45                 |  |
| DBY-25     | 3.5                | 4                       | 30              | 3                                  | 1450/1.5                           | 90                           | 150                    | 1" 丝扣<br>1" Screw thread                      | 140                |  |
| DBY-40     | 4.5                | 4                       | 30              | 3                                  | 1450/1.5                           | 90                           | 150                    | 40mm 法兰<br>40mm Flange                        | 140                |  |
| DBY-50     | 6.5                | 4.5                     | 30              | 3                                  | 1450/2.2                           | 90                           | 150                    | 50mm 法兰<br>50mm Flange                        | 195                |  |
| DBY-65     | 8                  | 4.5                     | 30              | 3                                  | 1450/2.2                           | 90                           | 150                    | 65mm 法兰<br>65mm Flange                        | 195                |  |
| DBY-80     | 16                 | 5                       | 30              | 3                                  | 1450/5.5                           | 90                           | 150                    | 80mm 法兰<br>80mm Flange                        | 435                |  |
| DBY-100    | 20                 | 5                       | 30              | 3                                  | 1450/5.5                           | 90                           | 150                    | 100mm 法兰<br>100mm Flange                      | 435                |  |

## 几种隔膜材料特性 Characteristic of diaphragm

| 介质种类<br>Medium | 隔膜品种<br>Variety           | 丁腈橡胶<br>Nitrile Rubber | 氯丁橡胶<br>Chloroprene Rubber | 氟橡胶<br>Fluorine Rubber | 聚四氟乙烯<br>PTFE | 食品橡胶<br>Food Rubber |
|----------------|---------------------------|------------------------|----------------------------|------------------------|---------------|---------------------|
| 发烟硝酸           | Smoke nitric acid         | ×                      | ×                          | △                      | △             |                     |
| 浓硝酸            | Density nitric acid       | ×                      | ×                          | △                      | △             |                     |
| 浓硫酸            | Density sulfuric acid     | ×                      | ×                          | ○                      | △             |                     |
| 浓盐酸            | Density hydrochloric acid | ×                      | △                          | △                      | △             |                     |
| 浓磷酸            | Density phosphoric acid   | ×                      | △                          | △                      | △             |                     |
| 浓醋酸            | Density acetic acid       | ×                      | ×                          | ×                      | △             |                     |
| 浓氢氧化钠          | Density sodium hydroxide  | ○                      | ○                          | △                      | △             |                     |
| 无水氨            | Non-aqueous ammonia       | △                      | △                          | △                      | △             |                     |
| 稀硝酸            | Thin nitric acid          | ×                      | ×                          | ○                      | △             |                     |
| 稀硫酸            | Thin sulfuric acid        | △                      | △                          | △                      | △             |                     |
| 稀盐酸            | Thin hydrochloric acid    | ×                      | ○                          | △                      | △             |                     |
| 稀磷酸            | Thin phosphoric acid      | ×                      | ×                          | △                      | △             |                     |
| 稀氢氧化钠          | Thin sodium hydroxide     | ○                      | ○                          | △                      | △             |                     |
| 氨水             | Liquid ammonia            | △                      | △                          | ×                      |               |                     |
| 苯              | Benzene                   | ×                      | ×                          | ○                      | ○             |                     |
| 汽油             | Gasoline                  | ○                      | ○                          | ○                      | ○             |                     |
| 石油             | Petroleum                 | △                      | ×                          | ○                      | ○             |                     |
| 四氯化碳           | Carbon tetrachloride      | ○                      |                            | ○                      | ○             |                     |
| 二硫化碳           | Carbon disulphite         | ○                      |                            | ×                      | ○             |                     |
| 乙醇             | Alcohol                   | ○                      | ○                          | ○                      | ○             |                     |
| 丙酮             | Acetone                   | ×                      | △                          | ×                      | ○             |                     |
| 甲酚             | Cresol                    | ×                      | △                          | △                      | ○             |                     |
| 乙醛             | Acetic aldehyde           | ×                      | ×                          | △                      | ○             |                     |
| 乙苯             | Ethylbenzene              | ×                      | ×                          | △                      | ○             |                     |
| 丙烯腈            | Acrylonitrile             | △                      | △                          | ×                      | ○             |                     |
| 丁醇             | Butanol                   | ○                      | ○                          | ○                      | ○             |                     |
| 丁二烯            | Butadiene                 | ○                      | ×                          | △                      | ○             |                     |
| 苯乙烯            | Styrene                   | ×                      | ×                          | △                      | ○             |                     |
| 醋酸乙酯           | Vinyl acetate resin       | ×                      | ×                          | ×                      | ○             |                     |
| 醚              | Ether                     | ×                      | ×                          | ×                      | ○             |                     |

注：○——寿命较长、△——寿命一般、  
×——不可用、本表仅从耐腐蚀性考虑，因聚四氟  
乙烯弹性比橡胶差，故实际使用寿命因压力，泵行  
程杂质等因素影响而异。食品橡胶专用于食品饮料  
行业。

Note:○—means the long service life,△—means common  
service life, ×—means use forbidden. This table is only  
considered from the anti-corrosion. Because the PTFE elasticity  
is worse than that in rubber. The actual use life will be affected  
because of the pressure and pump stroke factors. The food  
rubber specially uses for beverage industries.

## 正确选用隔膜 Select the Diaphragm Correctly

本隔膜泵的主要部件是隔膜，正确选用隔膜可  
以达到事半功倍的目的，用户订货时须注明输送介  
质的性质，以便出厂时配备不同隔膜，一般隔膜有  
下列几种：

- 一、丁腈隔膜，主要用于耐油场合。
- 二、氯丁橡胶5031#本单位特制，主要用于耐丙  
酮及各种酸类、碱类。
- 三、氟橡胶6021#本单位特制，主要用于高温  
150℃，耐甲苯耐腐蚀。但价格比其它隔膜高。
- 四、食品橡胶，专用于食品饮料的输送。

## 注意事项 Notes

- 一、轴承、活塞轴应及时加油，保持润滑系统  
正常运转。
- 二、出口压力不得超过0.3MPa；
- 三、该泵在使用中环境温度应小于40℃，电机  
温度不得超过75℃，开机时应先打开进口和出口阀  
门，严禁在关闭阀门时开机，以免造成损坏。
- 四、严禁在工作时关闭阀门，停机时应先关闭  
水泵，再关闭阀门。

The diaphragm is a major part of this diaphragm pump and  
correct selection of the diaphragm can get twice the result with half  
the effort. The users shall note nature of their working medium in  
their orders so as to provide appropriate diaphragms. Generally the  
diaphragms include the following types:

- I. Butyronitrile diaphragm, mainly for oil-proof applications.
- II. Neoprene 5031#, specially made by our company, mainly for  
resistance to acetone and different kinds of acid and alkaline.
- III. Fluorine rubber 6021#, specially made by our company,  
mainly for high temperature 150℃ and resistance to methylbenzene  
and corrosion, but more expensive than other diaphragm types.
- IV. Food rubber, exclusively for transportation of food and  
beverage.

1. Bearings and piston shafts shall be lubricated promptly to  
keep normal running of the lubrication system.
2. The outlet pressure shall not exceed 0.3MPa;
3. The pump's working ambient temperature shall be lower than  
40℃ and the motor temperature shall not exceed 75℃. To start it,  
first open the inlet and outlet valves. It's strictly prohibited from  
starting the pump while closing the valves to avoid damages.
4. It's strictly prohibited from closing the valve in the running  
state. To stop, first shut off the water pump and then the valves.