

NO.PG-JO20160801

PRODUCT GUIDE  
**SMO series**

**スルセルポンプ®**

Self-Priming Non-Clog Pump

**自吸式无堵塞泵**

Made in JAPAN



株式会社 **みつわポンプ製作所**  
**MITSUWA PUMP CO., LTD.**

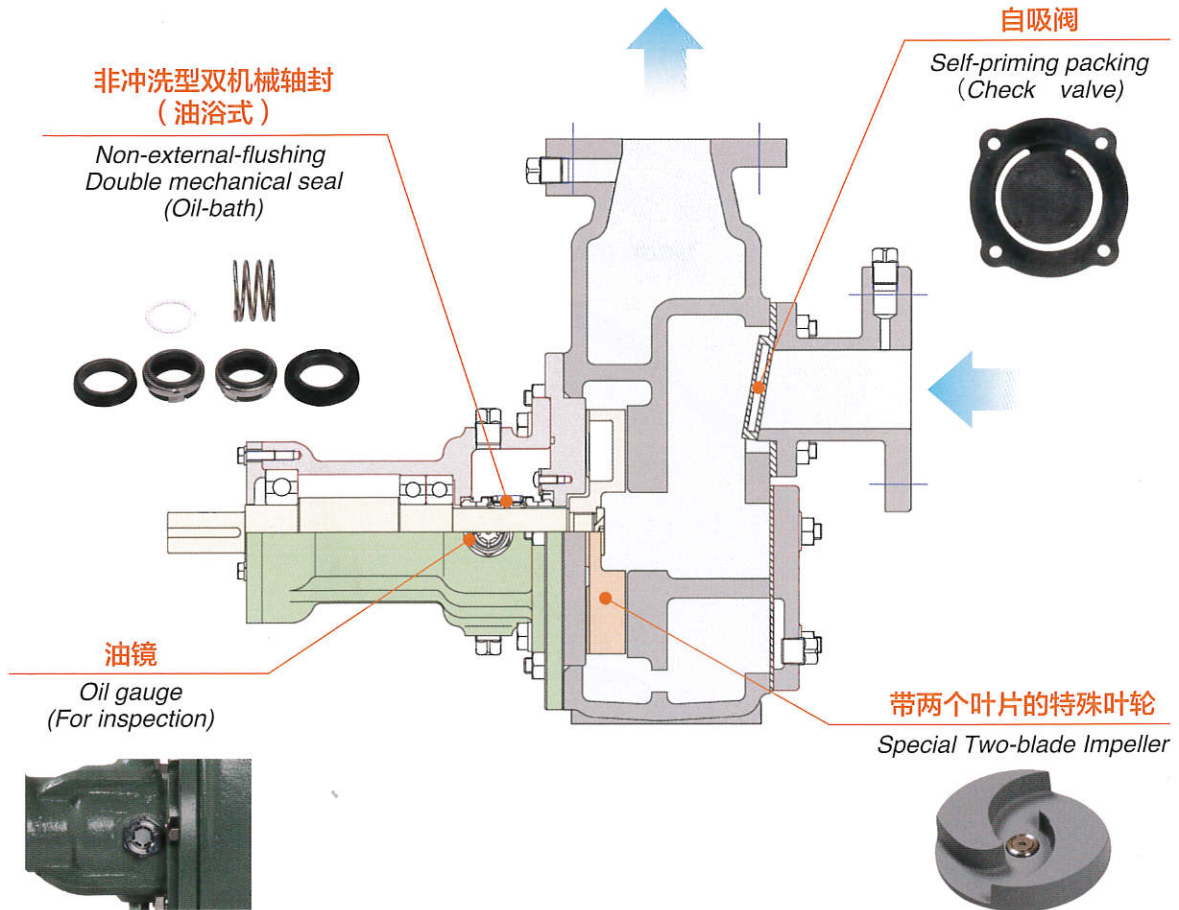
Since 1956

## 自吸式无堵塞泵 Self-Priming Non-Clog Pump

通过特有的带两个叶片的特殊叶轮解决异物、长条状物体造成的堵塞  
大多用作污水、污泥处理设备的污泥清除泵

Our innovative Special Two-Blade Impeller solves the problem of clogs  
by foreign matter and long objects

Chosen as the sludge withdrawal pump at multiple wastewater/sludge treatment facilities



### 型式表示 Model code

**2** **SMO** **-LB**

**A**

**B**

**C**

**A** 出水口径  
Pump Bore

2 ...2 inch(50A)  
2.5 ...2.5 inch(65A)  
3 ...3 inch(80A)

**B** 泵系列  
Pump Series

SMO ... 流通泵  
SMO Series

**C** 驱动方式  
Driven

-LB ... 皮带驱动式 (转速~2300min<sup>-1</sup>)  
V-belt (Speed~2300min<sup>-1</sup>)  
-MB ... 皮带驱动式 (转速2300min<sup>-1</sup>~)  
V-belt (Speed2300min<sup>-1</sup>~)

### 【注意】 NOTE

型号中不注明详细规格和特殊规格。

重复订购、咨询部件报价和订购部件时，请务必确认好生产编号。

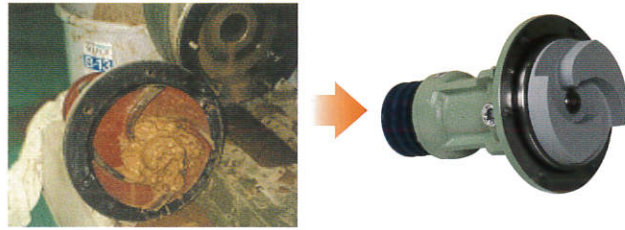
Detailed specifications and special specifications are not reflected in the model code.

For repeat orders and estimates or orders of parts, have the Serial Number ready when you contact us.

## 特点 Features

### 通过带两个叶片的特殊叶轮解决异物、长条状物体造成的堵塞 The Special Two-blade Impeller solves the problem of clogs by foreign matter and long objects

- 最大通过颗粒直径 Max. passing particle dia.  
2SMO-LB (MB).....  $\phi$  15mm  
2.5SMO-LB (MB).....  $\phi$  20mm  
3SMO-LB.....  $\phi$  25mm



### 具有优异的自吸性能，可用于多种用途 A variety of uses made possible by industry-leading self-priming ability

- 可用于正压运转、自吸运转等各种情况。  
Able to be used in various situations, such as draw-in operation and self-priming operation.
- 抽吸运转时，无需使用自吸桶、底阀等辅助设备。  
Auxiliary equipment, such as a self-priming tank or foot valve used in sucking operations, is not needed.
- 双涡形结构提供气液分离功能，也有利于将气体混入于液体。  
The double volute configuration allows gas to be separated during pumping, and for effective gas-liquid two phase pumping.

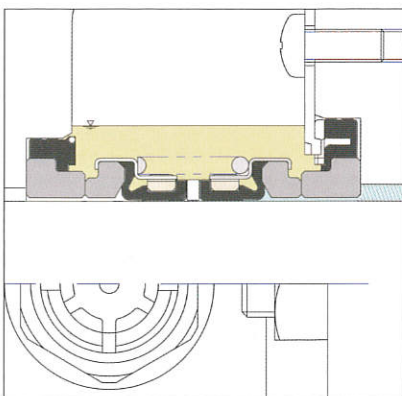
## ECO

### 标准采用非冲洗型双机械轴封（油浴式） Non-external-flushing double mechanical seal (oil-bath) is standard

- 在泵的关键部位，即轴封部采用双机械轴封，避免轴封部发生液体泄漏  
Leakage of fluid is prevented by using a double-mechanical seal for the gland, the principal component of the pump.
- 轴封部无需冲洗，可降低操作成本，并避免多余废液的产生。  
Flushing of the shaft seal is unnecessary, leading to a reduction in running costs and excess waste liquid not being generated.

※液体温度较高（60℃以上）、渣浆粒子过小（10μm以下）时，需要进行外部冲洗。  
请另行咨询制造商。  
If the liquid is hot (60°C or greater) or the slurry particles are very small (10 μm or less), external flushing is required. Please confirm with MITSUWA PUMP.

【双机械轴封剖面图】  
Part of mechanical seal



【泵分解状况】  
Decomposition state



### 通过背拉式（Back·Pull·Out）设计，提高维护便利性 Back-pull-out style makes maintenance easy

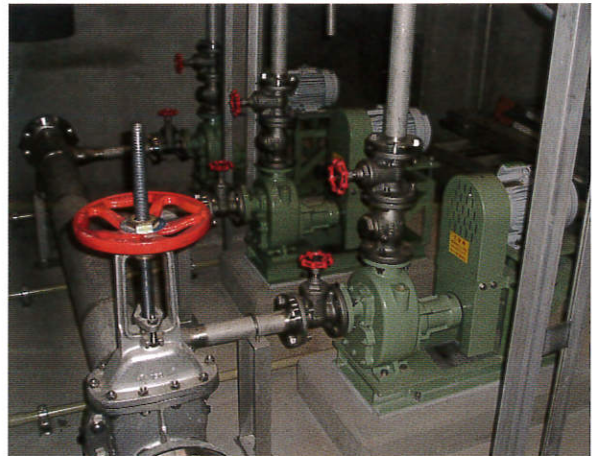
- 无需拆卸配管即可更换旋转部（机械轴封、叶轮等）的部件。  
Rotating parts (such as the mechanical iseal · mpeller) can be replaced without removing the piping.

## 主要用途 Major Applicatons

- 用于清除农业集中污水处理设施 ( JURUS ) 的污泥  
*Sludge withdrawal at residential wastewater treatment facilities (JARUS)*
- 用于循环、输送粪便处理厂 ( 后期处理 ) 的污泥  
*Sludge circulation and transport at excreta treatment plants (post process)*
- 家庭污水、工程污水、洗涤污水、深井污水等所有与污水相关的状况  
*Various wastewater related applications including gray water, wastewater from processing, detergent drainage, and pit drainage*
- 用于炼油厂的冲洗废液污水  
*Etching wastewater from refining plants*
- 用于输送药厂、实验机构的污水  
*Transport of wastewater from pharmaceutical experiment modules*



农业集中污水处理设施 污泥清除泵  
*Residential wastewater treatment facility Sludge withdrawal pump*



农业集中污水处理设施 污泥清除泵  
*Residential wastewater treatment facility Sludge withdrawal pump*



生活污水处理设备 ( 农业集中污水处理设备和粪便处理厂 ) 的污泥包括筛余物 ( 头发和异物 ) 。

半开放式叶轮型的泵  
如左图所示发生堵塞。

*Sludge at residential wastewater treatment facilities contains screen residues (hair and other foreign matter)*

*In a semi-open impeller type pump this can cause clogs, like in the picture to the left.*

带两个叶片的特殊叶轮型流通泵  
为不易发生堵塞的结构。

*The Special Two-blade Impeller type through cell pump has a structure that make it difficult for clogs to form.*



## 标准规格 Standard Specification

泵结构 Pump Structure		自吸式无堵塞泵 Self-priming Non-clog pump	驱动方式 Driven		V 型皮带、直结 V-Belt
法兰规格 Flange rating		符合 JIS10K Equivalent JIS10K	随附件 Accessory		底座、安全护盖 V 型皮带轮、V 型皮带 Base · Safety cover V-pulley · V-belt
结构 Construction	叶轮 Impeller	特殊两个叶片 Special two-blade	电 源 Power supply	相 Phase	三相 Three phase
	轴封 Gland	双机械轴封 Double mechanical Seal		电压 Volt	200V 级 / 400V 级 200V / 380V / 400V
	轴封水 Seal water	油浴式 (无需冲洗) Oil-bath	设置地点 Installation location		室外 / 室内 Outdoor / Indoor
	轴承 Bearing	滚珠轴承 (润滑脂密封 ZZ 型) Ball bearing (ZZ type)			

材 质 Material		SMO	SMO(S)	SMOS
	壳体 Casing	FC200	FC200	SCS13
	叶轮 Impeller	FC200	SCS13	SCS13
	主轴 Shaft	SUS316	SUS316	SUS316
	衬垫 Packing	NBR	NBR or FKM	NBR or FKM
	机械轴封 Mechanical Seal	SiC×SiC / NBR	SiC×SiC / NBR or FKM	SiC×SiC / NBR or FKM
	备注 Note	标准规格 Standard spec.	特殊规格 Option spec.	特殊规格 (仅 2SMO) Option spec. (Only 2SMO)

## 设计数据 Design data

泵规格 Pump specification		2SMO	2.5SMO	3SMO	
	出水口径 Pump Bore	mm	50×50	65×65	80×80
	流量 Capacity	m <sup>3</sup> / min	0.06~0.36	0.1~0.56	0.2~0.8
	全扬程 Total Head	mH	~18	~18	~16
	功率 Power	kW	1.5~3.7 (2~5HP)	2.2~5.5 (3~7HP)	2.2~5.5 (3~7HP)

最大抽吸扬程(m) Max. Suction Head(m)		液体温度 Liquid temperature				
		0℃	20℃	40℃	60℃	80℃
	2SMO type					
	2.5SMO type	-5m	-5m	-4m	-2m	±0m
3SMO type						

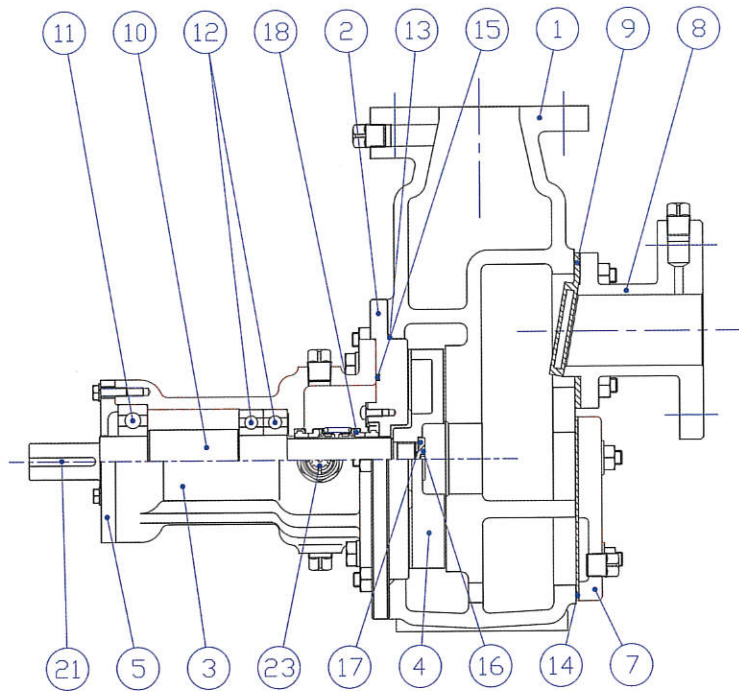
※抽吸配管全长为 MAX 8m。

※ The maximum total length of suction piping is 8m.

		2SMO	2.5SMO	3SMO
最大通过颗粒直径 Max. passing particle dia.	φ mm	φ 15 mm	φ 20 mm	φ 25 mm

输送液体对应范围 Transported liquid coverage	污泥浓度 Slurry concentration	≤ 10w%		
	活性污泥浓度 MLSS Mixed liquor suspended solids	≤ 30,000mg / ℓ		
	粘性 Viscosity	≤ 300mPa·s		
	液体温度 liquid temperature	≤ 60℃	(抽吸运转 Suction operation)	
	≤ 80℃	(正压运转 Draw-in operation)		

## 结构 / 部件列表 Structural drawing/Parts list



### 【注意】 NOTE

上图为“2SMO-LB”型的结构图。

产品因机型会存在些微不同，详情请咨询制造商。

The drawing above is of the configuration of the 2SMO-LB type.

Configurations vary slightly from model to model so contact

MITSUWA PUMP for further details.

No.	部件名称 Parts Name	数量 Q'ty
1	壳体 Casing	1
2	泵盖 Casing cover	1
3	轴承箱 Bearing case	1
4	叶轮 Impeller	1
5	轴承箱盖 Bearing case cover	1
7	排水孔盖 Drain cover	1
8	阀体 Valve case	1
9	自吸阀 Self-primng packing	1
10	主轴 Shaft	1
11	滚珠轴承 Ball bearing	1
12	滚珠轴承 Ball bearing	2
13	O型圈 O-ring	1
14	排水孔盖衬垫 Drain cover packing	1
15	O型圈 O-ring	1
16	埋头螺栓 Countersunk bolt	1
17	叶轮止动垫圈 Impeller retaining washer	1
18	双机械轴封 Double mechanical seal	1
21	键 Key	1
23	油镜 Oil gauge	1

## 外观 Appearance

- 横型卧式 (皮带驱动)  
Horizontal (Belt driven)

Model: 2SMO-LB



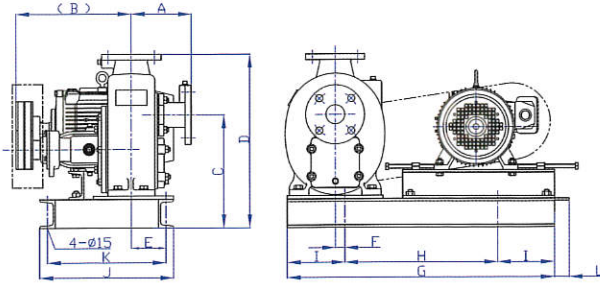
- 可移动式 (皮带驱动)  
Portable (Belt driven)

Model: 2SMO-LB

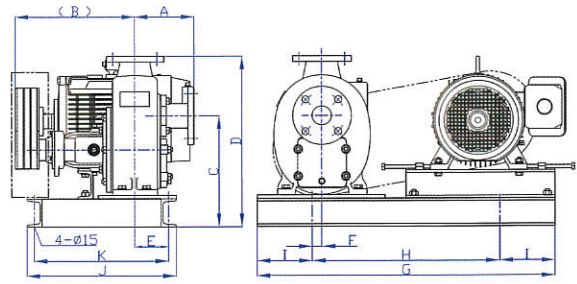


## 外形尺寸图 Out of Views

### ● 横型卧式 (皮带驱动) Horizontal (Belt driven)



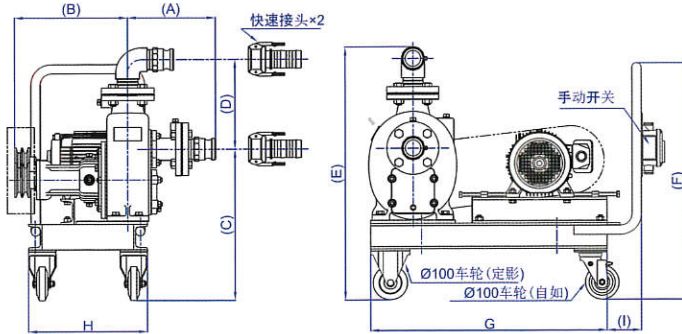
【图1】Dwg1



【图2】Dwg2

口径 Bore (mm)	型号 Model	功率 Motor Capacity		图号 Dwg	尺寸 (mm) Measurements (mm)											估算重量 About Weight (kg)	
		(kW)	(P)		A	B	C	D	E	F	G	H	I	J	K		L
50	2SMO-LB	1.5	4	1	158	333	296	455	37	25	700	400	150	350	310	38	124
	2SMO-LB	2.2	4														138
	2SMO-MB	3.7	4														146
65	2.5SMO-LB	2.2	4	1	166	343	314	459	39.5	25	700	400	150	350	310	38	145
	2.5SMO-LB	3.7	4			153											
	2.5SMO-MB	5.5	4	2	363	80	800	500	400	360	-	182					
80	3SMO-LB	3.7	4	2	160	370	384	544	67.5	25	800	500	150	400	360	-	176
	3SMO-LB	5.5	4			391											201

### ● 可移动式 (皮带驱动) Portable (Belt driven)



【图3】Dwg3

### 【随附件】 Accessories

- 抽吸软管 ..... 10m  
Suction hose
- 排出软管 ..... 10m  
Delivery hose
- 快速接头 ..... 2个  
One-touch hose coupler
- 手动开关 ..... 1个  
Hand switch
- 电缆 ..... 15m  
Cable
- 连接插头 ..... 1个  
Attachment plug

※如需出口, 请另行咨询。

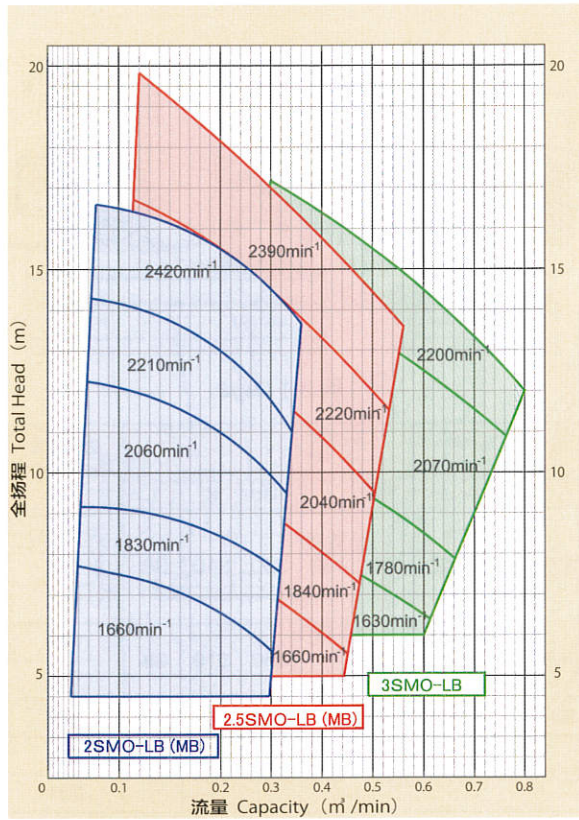
Please contact us to discuss export projects

口径 Bore (mm)	型号 Model	功率 Motor Capacity		图号 Dwg	尺寸 (mm) Measurements (mm)											估算重量 About Weight (kg)	
		(kW)	(P)		A	B	C	D	E	F	G	H	I				
50	2SMO-LB	1.5	4	-	259	333	446	264	745	696	700	350	100				134
	2SMO-LB	2.2	4	148													
	2SMO-MB	3.7	4	156													
65	2.5SMO-LB	2.2	4	-	274	343	464	273	745	696	700	350	100				155
	2.5SMO-LB	3.7	4	163													
80	3SMO-LB	3.7	4	-	269	370	534	298	745	791	800	400	100				186

※可移动式类型适用于电机功率为 3.7kW 以下的机型。

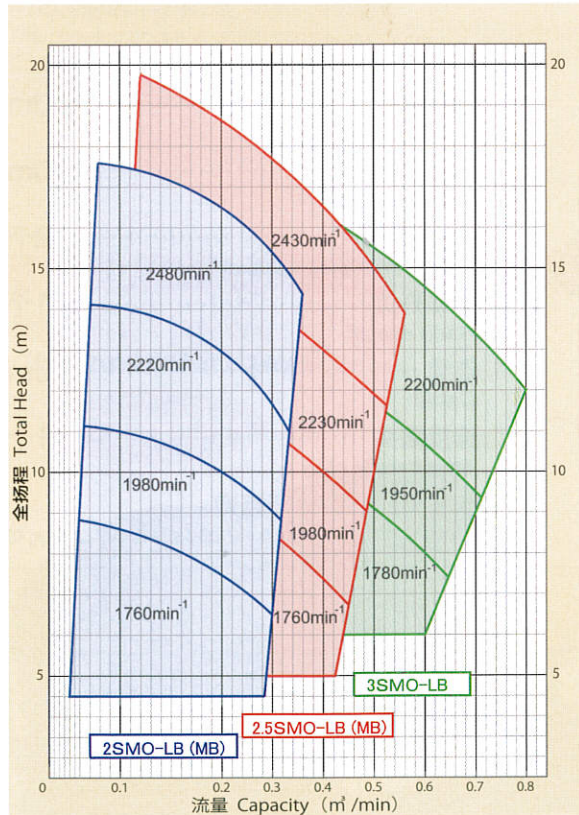
※Portable types are only for a motor capacity of 3.7 kW or less.

## 选定表 Selection Chart



# 50Hz

口径 Bore (mm)	型号 Model	转速 Speed (min <sup>-1</sup> )	参考功率 Motor Capacity		Spec. ①		Spec. ②	
			(kW)	(P)	流量 Capa city (m <sup>3</sup> /min)	全扬程 Total Head (m)	流量 Capa city (m <sup>3</sup> /min)	全扬程 Total Head (m)
50	2SMO-LB	1660	1.5	4	0.1	7.5	0.2	6.5
	2SMO-LB	1830	2.2	4	0.1	9	0.2	8
	2SMO-LB	2060	3.7	4	0.1	12	0.2	11
	2SMO-LB	2210	3.7	4	0.1	14	0.2	12.5
	2SMO-MB	2420	3.7	4	0.1	16.5	0.2	15.5
65	2.5SMO-LB	1660	2.2	4	0.3	7	0.4	6
	2.5SMO-LB	1840	3.7	4	0.3	9	0.4	8
	2.5SMO-LB	2040	3.7	4	0.3	12	0.4	10.5
	2.5SMO-LB	2220	5.5	4	0.3	14.5	0.4	13
	2.5SMO-MB	2390	5.5	4	0.3	17	0.4	15.5
80	3SMO-LB	1630	2.2	4	0.5	7.5	0.6	6.5
	3SMO-LB	1780	3.7	4	0.5	9	0.6	8.5
	3SMO-LB	2070	5.5	4	0.5	13.5	0.6	12.5
	3SMO-LB	2200	5.5	4	0.5	15.5	0.6	14.5



# 60Hz

口径 Bore (mm)	型号 Model	转速 Speed (min <sup>-1</sup> )	参考功率 Motor Capacity		Spec. ①		Spec. ②	
			(kW)	(P)	流量 Capa city (m <sup>3</sup> /min)	全扬程 Total Head (m)	流量 Capa city (m <sup>3</sup> /min)	全扬程 Total Head (m)
50	2SMO-LB	1760	1.5	4	0.1	8.5	0.2	7.5
	2SMO-LB	1980	2.2	4	0.1	11	0.2	10
	2SMO-LB	2220	3.7	4	0.1	14	0.2	13
	2SMO-MB	2480	3.7	4	0.1	17.5	0.2	16.5
65	2.5SMO-LB	1760	2.2	4	0.3	8.5	0.4	7.5
	2.5SMO-LB	1980	3.7	4	0.3	11	0.4	10
	2.5SMO-LB	2230	5.5	4	0.3	14.5	0.4	13
	2.5SMO-MB	2430	5.5	4	0.3	17.5	0.4	16.5
80	3SMO-LB	1780	3.7	4	0.5	9	0.6	8
	3SMO-LB	1950	5.5	4	0.5	11.5	0.7	9.5
	3SMO-LB	2200	5.5	4	0.5	15.5	0.8	12

※ 选定表中为清水时的数据。根据液体比重、粘性等，功率和性能可能不同。

※ 选定表中为搭载功率为 IE3 级的电机时的数据。

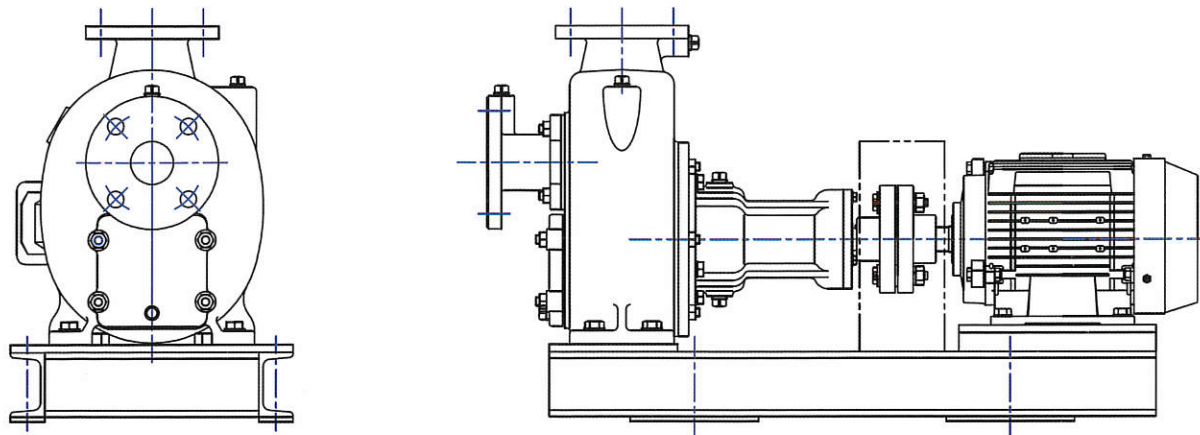
※ The selection chart contains the data for pure water. Power and performance may vary according to the specific gravity and viscosity of the liquid.

※ The selection chart contains data based on equipment having a motor with class IE3 efficiency.



## 选择另件 Option

### ●直结式 (联轴器驱动) Direct(Coupling driven)

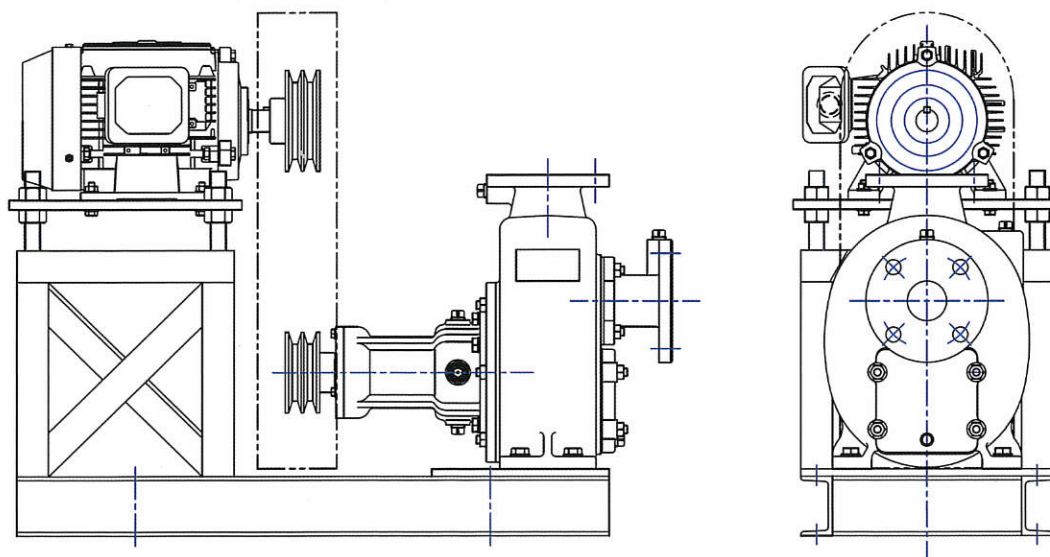


#### 【备注】NOTE

限定频率为 60HZ 的地区。  
频率为 50HZ 的地区请通过变频器设定为 60HZ。  
关于泵的性能，请参照右表。  
*Limited to areas using a frequency of 60 Hz.  
When using in an area with a frequency of 50 Hz,  
please use a setting of 60 Hz with an inverter.  
Please refer to the chart to the right for pump performance.*

口径 Bore (mm)	型号 Model	转速 Speed (min <sup>-1</sup> )	参考功率 Motor Capacity		Spec. ①		Spec. ②	
			(kW)	(P)	流量 Capa city (m <sup>3</sup> /min)	全扬程 Total Head (m)	流量 Capa city (m <sup>3</sup> /min)	全扬程 Total Head (m)
50	2SMO	1760	1.5	4	0.1	8.5	0.2	7.5
65	2.5SMO	1760	2.2	4	0.3	8.5	0.4	7.5
80	3SMO	1780	3.7	4	0.5	9	0.6	8

### ●对向二阶型 (皮带驱动) The second floor facing(Belt driven)



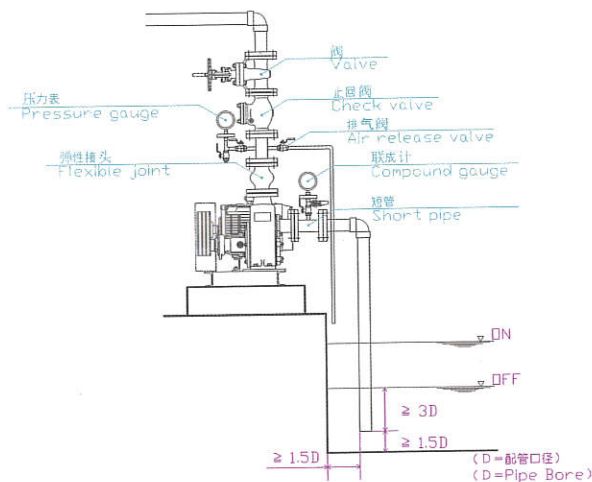
#### 【备注】NOTE

泵的性能与左页 (选定表) 相同。  
但是，原则上讲，仅适用于电机功率为 3.7kW 以下的机型。  
*Pump performance is the same as that on the left page (selection table).  
However, in principle it can only be used with a motor capacity of 3.7kW or less.*

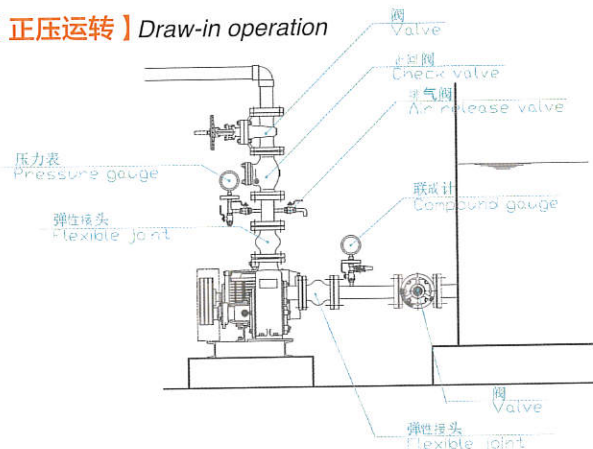
※详情请咨询制造商。  
※Please contact MITSUWA PUMP for details.

## 安装示例 Example of execution

### 【抽吸运转】Suction operation



### 【正压运转】Draw-in operation



### 抽吸配管 Suction piping

- 请针对配管设置支撑装置（支撑），避免因配管自身的重量或紧固时产生的歪斜对泵造成影响。  
Use supports for the pipes so that strain is not placed on the pump by the weight or tightness of the pipes.
- 请仔细安装配管接头，以防止空气进入。  
Attach pipe fittings carefully and be sure not to allow any air to enter.
- 请充分注意最低水位...等等，避免配管端空气吸入。  
Pay attention to the minimum water level, etc., so that no air is taken into the pipe ends.

#### 【抽吸运转】Suction operation

- 为防止空气滞留，请将配管设置在泵的**上坡方向**（1/100以上）。  
To prevent air entrapment, arrange the pipes on an upward slope (1/100 or greater) in the direction of the pump.
- 原则上，配管口径需与泵的口径一致。  
As a rule, use pipes with the same bore as the pump.
- 原则上请需单独配管。当主管线上并列设置多个泵时，注意将处于停止状态的泵的阀全部关闭，以避免停止中的泵产生负压、背压。  
As a rule, the pipes should be single piping. When multiple pumps are placed in parallel on a header pipe, be sure to completely close the valves of stopped pumps so that there is no negative pressure or back pressure on the pumps.
- 无需底阀。需要时请安装过滤器。  
A foot valve is unnecessary. Attach a strainer only as needed.

#### 【正压运转】Draw-in operation

- 为防止空气滞留，请将配管设置在泵的**下坡方向**（1/100以上）。  
To prevent air entrapment, arrange the pipes on a downward slope (1/100 or greater) in the direction of the pump.
- 原则上，配管口径需大于泵的出水口径或至少与泵的口径一致。  
As a rule, use pipes with the same or more bore as the pump.
- 需要时请安装过滤器。  
Attach a strainer as needed.

### 排出配管 Delivery piping

- 请针对配管设置支撑装置（支撑），避免因配管自身的重量或紧固时产生的歪斜对泵造成影响。  
Use supports for the pipes so that strain is not placed on the pump by the weight or tightness of the pipes.
- 可能发生水锤（水击）时，请采取安装缓闭止回阀或旁道（by-pass）止回阀等措施。  
If there is a possibility of water hammer, take measures such as installing a gradually closing check valve or a bypass check valve.

### 备注 Note

- 可能发生冻结时，请采取防冻措施。  
Where there is a possibility of freezing, take measures to prevent freezing.
- 输送液体可能凝固、沉淀时，请设置冲洗管路（冲洗压力 0.3MPa 以下）。  
Where there is a possibility of the transported liquid coagulating or precipitating, install a washing line (washing pressure 0.3 MPa or less).

## 选择泵时所需的信息 Information required to select pump

● 送货地址

Delivery destination

● 终端用户

End user

● 预定送货日期

Delivery data

● 台数

Quantity

台  
unit

### 运转条件 Operating conditions

● 液体名称

Name of liquid

● 液体比重

Specific gravity of liquid

kg/l

● pH

pH

● 渣浆浓度

Slurry concentration

%

● 粘性

Viscosity

cp

● 液体温度

Liquid temperature

°C

● 粒子直径

Solid particle diameter

mm  
μm

● 流量

Capacity

m<sup>3</sup>/min

● 全扬程

Total head

m

● 抽吸扬程

Suction head

正压运转

Forced operation

m

抽吸运转

Suction operation

m

● 运转时间

Operating time

连续运转

Continuous

hr/day

间断运转

intermittent

hr/day

● 设置地点

Location

室外

Outdoor

室内

Indoor

### 电机条件 Motor conditions

● 类型

Type

制造商标准 (全密闭式室外风扇型)

Maker standard (Outside the closed out door fan type)

其他

Other

● 电压

Voltage

V

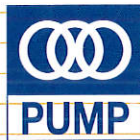
● 频率

Frequency

HZ

### 其他 Other

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**SMD series**



代理店 Agency

製造元 Maker



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