



三 錦 泵 浦
SUNNY KING PUMPS

液 封 式 真 空 泵 浦

Liquid ring vacuum pump



液封式真空泵特點



Features of our pump

液封式真空泵浦是可使用製程液體作為密封液的一種真空泵浦，又稱水封式真空泵。

液封式真空泵特別適合工作過程中有蒸氣逸出，尤其是製程中容易產生水氣之壓力範圍，如真空含浸、真空乾燥、蒸餾、溶劑回收等濕式抽氣過程 (Wet Process)。液封式真空泵亦特別適用於含有機溶劑及粉塵之氣體抽取。

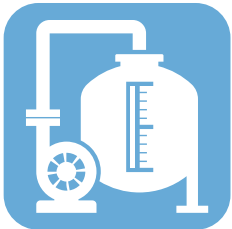
Our liquid ring vacuum pump is especially suitable for long and continuous operation because of its simple but sturdy structure. The impellers are the only moving parts in the pump and they do not have contact with the casing. Also, liquid ring vacuum pump does not require internal lubrication. Therefore, only low routine maintenance is required and downtime becomes less.

- | | |
|------------------|--|
| 構造簡單堅固，耐久性及可靠性高 | ▶ Simple but Sturdy Structure / Highest Durability and Reliability |
| 近似等溫壓縮，出口溫度低安全性高 | ▶ Near Isothermal Compression / Higher Pumping Speed / Lower Temperature / Better Safety |
| 可使用製程液體作為密封液 | ▶ Possible to utilize process liquid as Service Sealants |
| 低振動，經濟的安裝及維護成本 | ▶ Low vibration, low installation & maintenance cost. |
| 不排放油煙，較低的環境影響 | ▶ Less Air Pollution, lower environment impact |

針對液封式真空泵的產品特點，我們提供給各種產業完整的解決方案，包括：

We provide to many industrial products and system solutions, including:

化工、石油化學



Chemical

水處理



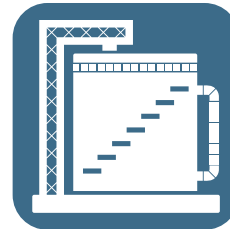
Water Treatment

礦業、鋼鐵



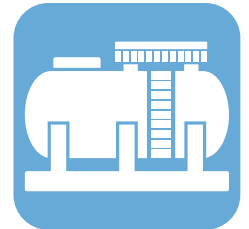
Mining
Steel

石油及天然氣



Oil and Gas

生物科技、
食品、製藥、
造紙及塑膠產業



Biotechnology, Food,
Pharmaceutical, Paper
And Plastic Industry

可當成真空泵封液使用的液體例如：

Some other liquids used as the vacuum pump sealant are:

醋酸
酒精
煤油
甲苯
二醇
己烷
硫酸
丙酮



Acetic Acid
Alcohols
Kerosene
Toluene
Glycols
Hexane
Sulfuric Acid
Acetone

液封式真空泵操作原理



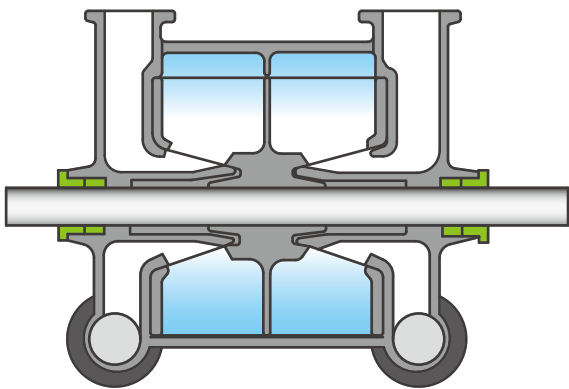
Principle of Operation

本型真空泵內部由多片葉片組合而成的一組葉輪與偏心圓形機殼組合而成。當葉輪轉動時，液體受離心力作用在機殼內形成一液封環，使葉輪和液封環之間氣室逐漸變大而吸入氣體。當吸滿氣體後葉輪和液封環之間氣室又因液體填充而逐漸縮小最後將氣體排出。如此周而復始，利用葉輪與液封環之間氣室的容積變化達到宛如活塞吸氣、壓縮、排氣的效果。

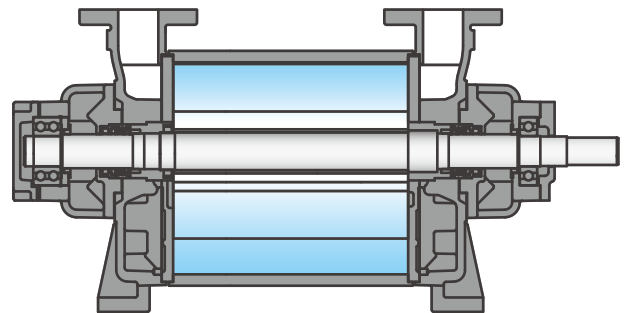
Liquid ring vacuum pump works on the liquid piston principle. The shaft and the impeller assembly are placed eccentrically relative to the pump casing. As the pump impeller rotates, a liquid ring is formed in the casing by the centrifugal force. Then, the air is drawn in through the suction port when the capacity between the impeller and liquid ring gradually expands. After the air fills up the capacity and the liquid is forced back to the space between impeller blades, the capacity between the impeller and liquid ring decreases gradually. Eventually, the air is compressed and discharged. Here, the variation of capacity between the impeller and the liquid ring acts like a liquid piston action.

1. 吸入行程：氣體由風座入口(A)處 吸入葉輪氣室
2. 壓縮行程：葉輪氣室內的氣體經由葉輪轉動被壓縮
3. 排出行程：氣體由風座出口(B)處排出
4. 密封區：此區將入口與出口之空氣隔離，使真空得以產生

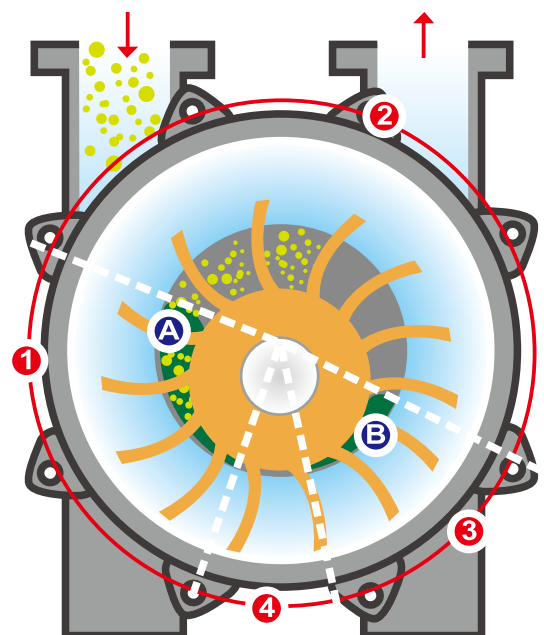
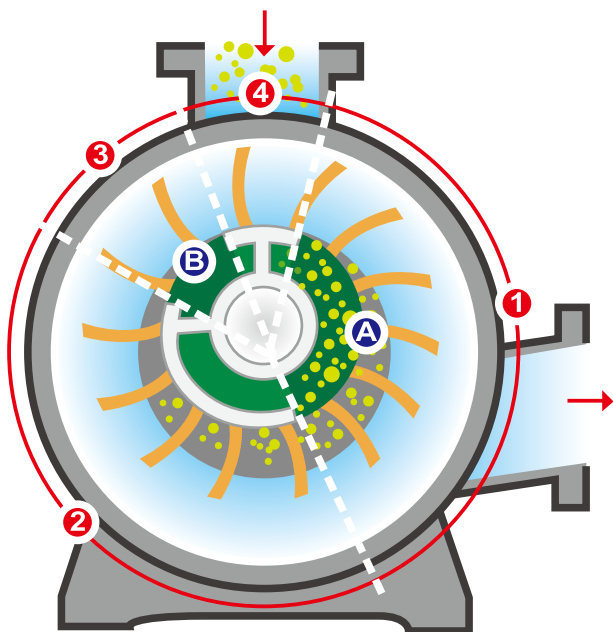
1. Suction phase : The inlet seat (A) draws gas into casing.
2. Compression phase : Gas is compressed in pump casing.
3. Discharge phase : Gas is discharged from the outlet seat (B).
4. Seal phase : The partition of head and seat insulates the gas of the inlet from the gas of outlet resulting in vacuum production.



錐套式 Conical



平面式 Flat Sided



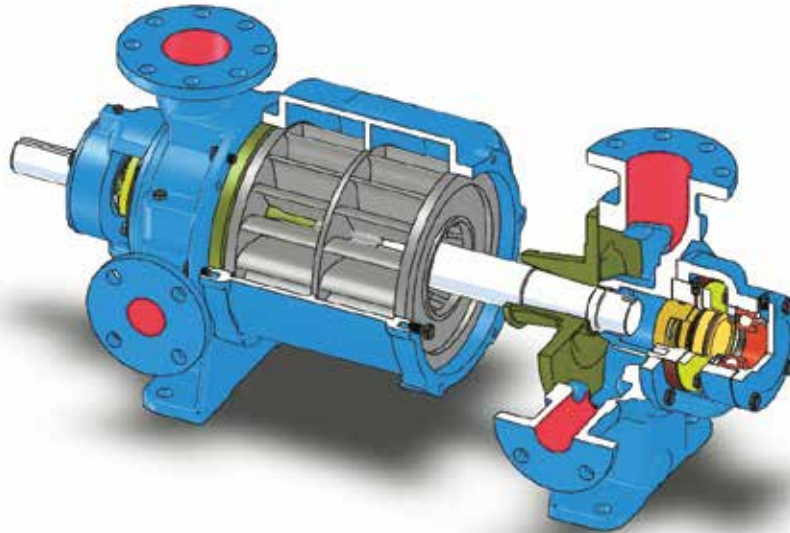
徑流式錐形風座設計



Radial flow-Conical port design

採用錐形風座設計的真空泵，由於其氣體為徑向吸入/排出方式，於真空泵運轉中不容易於機件上累積雜質，降低了零件的磨損程度，此種設計具有對氣體及密封液中的雜質及異物最佳的耐受能力。

Due to the radial-flow air intake/outflow, impurities do not accumulate easily in the mechanical parts during vacuum pump operation, reducing the wearing out of mechanical parts. This design provides optimal tolerance for impurities and foreign objects in the air and sealant.



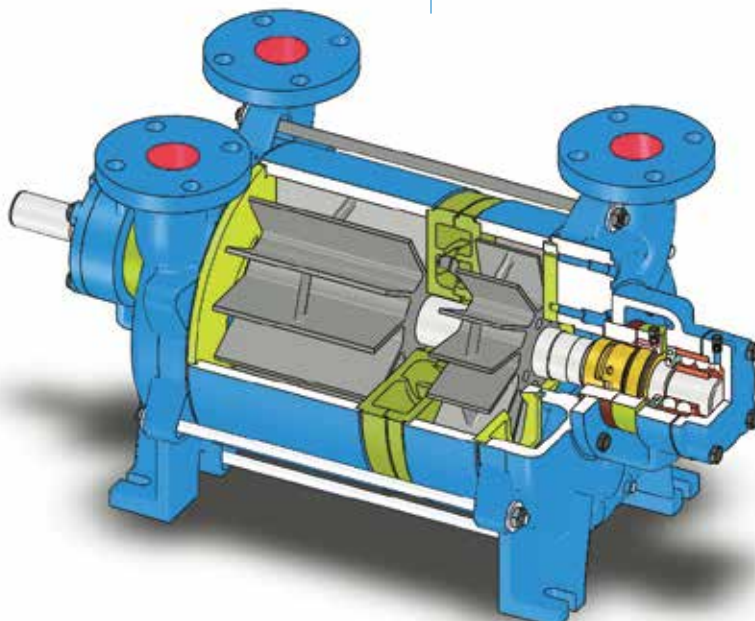
軸流式平板形風座設計



Axial flow -Flat Sided port design

使用軸流式平板形風座設計的真空泵其氣體為軸向吸氣/排氣方式，具有比較好的功能/價格比。

Due to the axial-flow air intake/outflow, vacuum pumps with axial-flow flat-sided port design offers better price/ performance ratio.



封液溫度與最高真空及排氣量之關係



Influence of Sealant Temperature on Pumping Speed & Ultimate Pressure

液封式真空泵的最高真空會受到封液的蒸氣壓影響，而蒸氣壓會因為封液溫度改變而產生變化。當封液溫度上升時，蒸氣壓也會變高，進而使排氣量減少。因此，若封液水溫不是15°C時，單段型請依圖一，雙段型請依圖二校正實際排氣量。若泵浦超過最大操作真空範圍時，將產生空蝕現象及噪音振動，請避免使用於此一區間。

Sealant temperature has influence on the vapor pressure of the sealant. When the temperature rises, the vapor pressure rises too, which results in lower pumping speed and vacuum. The ultimate pressure (Max. vacuum) of the pump can not be obtained. Consequently, if the temperature of the sealant is not at 15°C, please calibrate your actual pumping speed. Single-stage and two-stage models refer to Fig. 1 and Fig. 2 respectively. When the vacuum pump operates beyond the range of maximum operating vacuum, cavitation happens. Loud noise and vibration can be heard. Please avoid it.

計算例 Example of calculation

當封液水溫20°C時，計算雙段型液封式真空泵SWV-211於60 Torr下的真空度時的排氣量：

When sealant temperature at 20°C, calculate the pumping volume of two-stage liquid ring vacuum pump SWV-211 at 60 Torr:

公式 / Formula : $S_T = K \times S_{15} (\text{m}^3/\text{min})$

某特定溫度下之排氣量 = S_T = Pumping speed at a specific temperature

封液水溫度換算係數 = K = Conversion coefficient of sealant temperature

15°C時對應的排氣速度 = S_{15} = Corresponding pumping speed at 15°C

查性能表上SWV-211@ 60 Torr
於水溫15°C時的排氣速度
 $S_{15} = 5400 \text{ L/min}$

雙段型查圖二 20°C時對應的排氣速度
曲線得出封液水溫度換算係數
 $K = 0.93$

得出 SWV-211於封液水溫20°C時
排氣量為
 $S_{20} = 0.93 \times 5400 \text{ L/min} = 5020 \text{ L/min}$

Step 1

Referring to pumping speed of SWV-211@60 Torr at water temperature 15°C, in the performance table
 $S_{15} = 5,400 \text{ Liter/min}$

Step 2

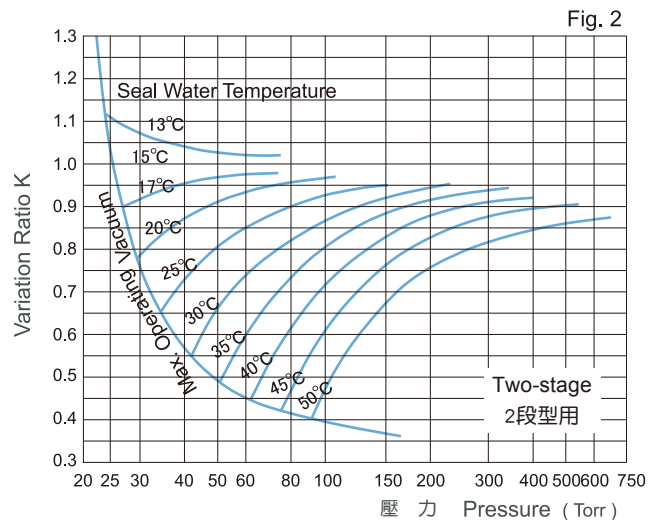
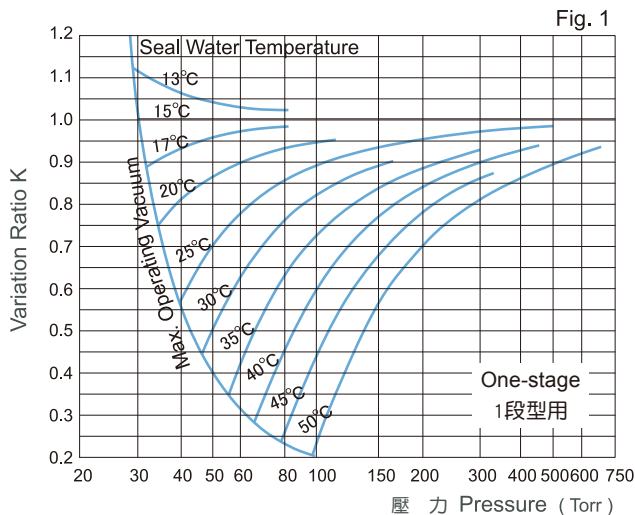
Two-stage model, referring to the curve of corresponding pumping speed at 20°C in (Fig. 2)
We get conversion coefficient of sealing water temperature
 $K = 0.93$

Step 3

The calibrated pumping speed is when SWV-211 is at sealing water temperature of 20°C
 $S_{20} = 0.93 \times 5,400 \text{ L/min} = 5,020 \text{ L/min}$

蒸氣壓：一般而言液體溫度上升時，會加快蒸發速率，進而產生較大的蒸氣壓。

Vapor pressure: Theoretically, as the liquid temperature rises, it will speed up vaporizing rate and produces higher vapor pressure.



液封式壓縮機



Liquid ring compressor

在許多工業的製程應用裡經常需要使用到壓縮機。如果壓縮的氣體含水分、蒸氣或是雜質等，液封式壓縮機無疑是最佳選擇。由於液封式壓縮機具有近似等溫壓縮的特性，對於化工、石油化學工業製程中壓縮含水氣、毒性、腐蝕性或是易爆性氣體具有很高的安全性與可靠性。三錦低壓液封式壓縮機可處理2.5 bar 以下的壓縮氣體。

Compressors are often required in many industrial processes. If a compressor's gas contains water, vapor or impurities, a liquid ring compressor is no doubt the best choice. As liquid ring compressor provides nearly isothermal compression, it is highly safe and reliable in compressing moist, toxic, corrosive or explosive gases in chemical and petrochemical industrial processes. Sunny King liquid ring compressors are built to handle pressures of 2.5 bar and below.

液封式壓縮機性能表 Liquid ring compressor Performance Table

型號 Model	轉數 Speed RPM	各排出壓力下之排氣量Q (m ³ /min)與軸馬力L(HP) Discharge Capacity(Q) and Shaft Power(L) at Each Discharge Pressure												Flange Size (inch)		液封水量 Seal Water Supply HP
		0.2 kg/cm ²		0.4 kg/cm ²		0.6 kg/cm ²		0.8 kg/cm ²		1.0 kg/cm ²		1.2 kg/cm ²		入口徑 Inlet	出口徑 Outlet	
		Q	L	Q	L	Q	L	Q	L	Q	L	Q	L			
SW-3	1750	0.82	2.4	0.80	2.6	0.78	2.9	0.76	3.3	0.75	3.7	0.70	4.6	2	2	7
SW-5	1750	1.72	4.1	1.69	4.5	1.65	5.0	1.62	5.7	1.58	6.4	1.50	7.9			10
SW-7	1750	2.60	6.2	2.55	6.8	2.50	7.5	2.44	8.5	2.39	9.7	2.30	12.0			15
SW-10	1980	3.33	7.8	3.27	8.7	3.20	9.5	3.13	10.8	3.06	12.3	2.95	15.2	2	2	20
SW-20	1400	7.61	16.0	7.46	17.7	7.31	19.4	7.15	22.1	7.00	25.0	6.85	31.0	3x2	2x2	35
SW-40	1150	10.5	21.7	10.3	23.8	10.1	26.2	9.87	29.9	9.66	33.7	9.45	42.2	3x2	2x2	45
SW-50	970	18.4	40.0	18.0	41.6	17.7	45.3	17.3	50.6	16.9	59.1	16.5	70.5	4x2	3x2	60
SW-80	690	23.6	51.0	23.1	53.4	22.7	58.1	22.2	64.9	21.7	75.9	21.1	90.1	5x2	5x2	80
SW-125	700	40.7	84	40.0	92.1	39.1	101	38.2	114	37.4	131	-	-	5x2	5x2	120
SW-130	590	45.6	94	44.7	103	43.8	114	42.9	128	42.0	146	-	-	6x2	6x2	140
SW-150	530	50.8	105	49.8	115	48.9	126	47.8	143	46.7	163	-	-	6x2	6x2	165



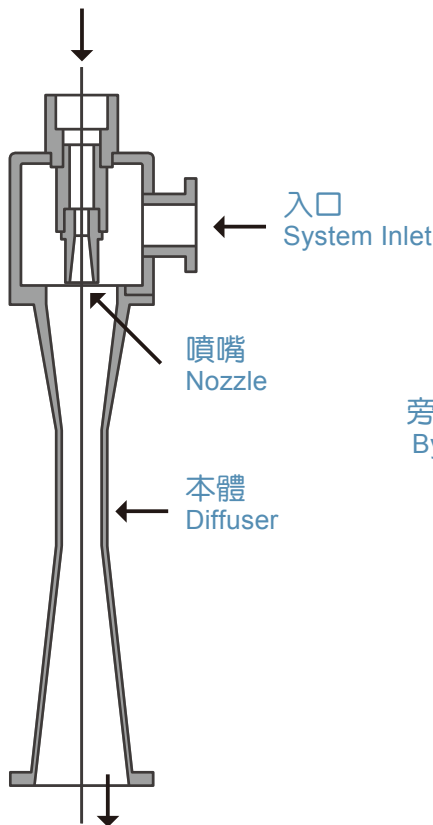
SE 型空氣噴射器 SE Air Ejector

三錦 SE型空氣噴射器係利用壓力流體高速流動，於通過噴嘴時產生真空吸引力。SE型空氣噴射器的動力來源為大氣或吸入之氣體，可在不藉助其它機械動力設備下，達到抽送流體的目的。和雙段液封式真空泵一起使用時，可得到封液蒸氣壓以下的壓力。其最高真空可提升至2-6 Torr，實用操作真空範圍約在10~40 Torr之間。SE型空氣噴射器可加裝旁通管(Bypass)以提升抽氣效率。SE型空氣噴射器與液封式真空泵一併使用時操作安靜，泵浦達最高真空(Ultimate pressure)無流量時，泵浦也不會因空蝕產生噪音或損壞。

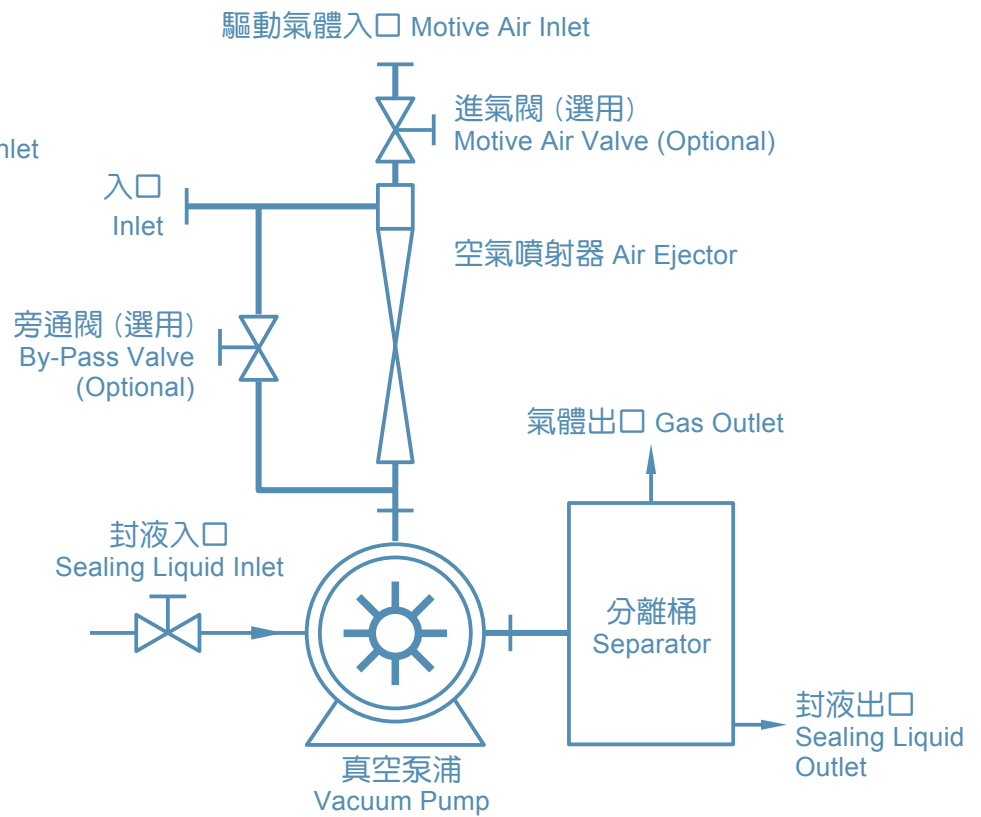
SUNNY KING SE type air ejector produces vacuum by converting pressure energy of a motive fluid into velocity energy when it flows through the nozzle. The source of energy comes from atmosphere or sucked in gases. It can draw gas without the assistance of power mechanical equipment. In addition, it can reach the pressure under sealant vapor pressure. The ultimate pressure can be push to 2~6 Torr and the practical operating pressure is between 10~40 Torr. The liquid ring vacuum pump runs quietly when attaching SE air ejector. Even the pump reaching the ultimate pressure and no fluid passing through, it will not occur noise or damage caused by air cavitation.

空氣噴射器示意圖 Illustration of Air Ejector

驅動氣體入口 Motive Air in



連結至真空泵浦
To Liquid Ring Vacuum Pump



液封式真空泵/壓縮機工程化機組



Liquid Ring Vacuum Pump Engineered Systems

液封水回收

由於環保問題日益受到重視，液封式真空泵處理含有機溶劑及其他化學物質氣體時，其封液的排放管理也變成一項重要課題。循環式封液回收系統設計可將封液(水)回收使用減少水的使用量。利用此封液回收系統，使工廠於生產過程中能有效減少封液排放量及能源消耗，更容易符合環保法規要求，降低操作成本。

全循環回收系統：

當輸送氣體或液封水具有毒性或危害風險，且不容許產生環境汙染時推薦使用

Sealing Liquid Recovery

Sealant recovery system is designed for recycling the seal liquid (water) of the vacuum pump. During the operation, a heat exchanger is applied to cool down the temperature of the recycling liquid to keep the pumping speed running normally. This recycling design helps to minimize the amount of water consumption. The reduction of water and energy consumption can directly lead to a lower operation cost. The last but not the least, this system can handle the pumping gases with organic solvent or chemicals properly. It is a friendly design to environmental protection.

Full Circulation Recovery System:

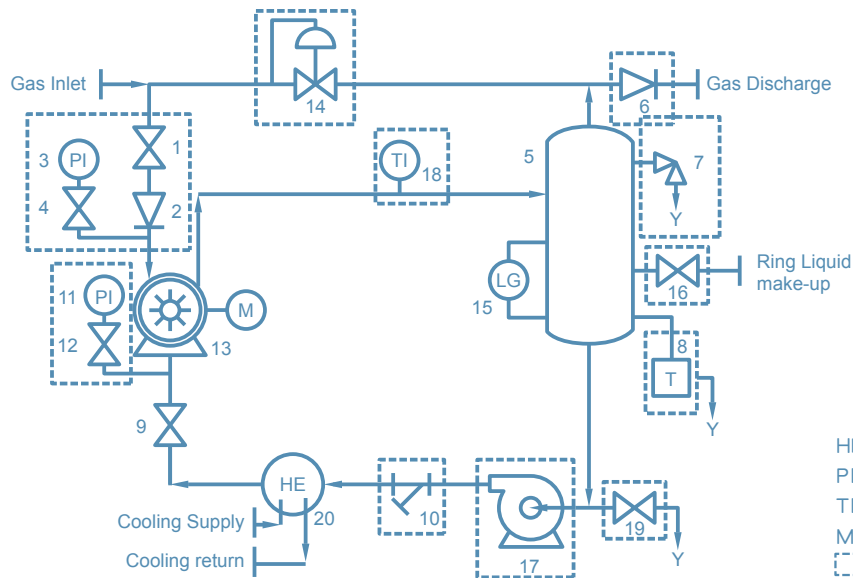
Recommend when pumped gas or sealing liquid is toxic or hazardous, and environmental pollution is not allowed.

優點

- 將非危險區的冷卻系統與危險製程區液封水隔離 ◀
- 具有低液封水消耗特點 ◀
- 允許入口可冷凝氣體回收 ◀

Advantages

- ▶ Cooling system in the non-hazardous zone is separated from sealing liquid in the hazardous process zone.
- ▶ Low sealing liquid consumption.
- ▶ Condensed gas may be recovered at inlet.



HE：熱交換器
 PI：壓力錶
 TI：溫度錶
 M：馬達 Motor
 □：選配設備 Optional Devices

編號 NO.	名稱 Parts Name	編號 NO.	名稱 Parts Name
1	入口隔離閥 Inlet isolation valve	11	壓力表 Pressure gauge
2	逆止閥 Check valve	12	表頭隔離閥 Gauge Isolation valve
3	壓力表 Pressure gauge	13	真空泵及馬達 Vacuum pump & drive
4	表頭隔離閥 Gauge isolation valve	14	入口壓力控制閥 Inlet pressure control valve
5	水氣分離循環桶 Gas/liquid separator	15	液位計 Level gauge
6	出口逆止閥 Outlet check valve	16	補水閥 Level make up valve
7	安全閥 Relief valve	17	循環泵 Circulation pump
8	隔氣彎管 Liquid drain trap	18	溫度表 Thermo indicator
9	隔離閥 Isolation valve	19	洩水閥 Drain valve
10	Y型過濾器 Y strainer	20	熱交換器 Heat exchanger

MW 機械助力真空泵機組



MW mechanical booster pump unit

高真空區域使用時可獲得大排氣量節省高額電費

液封式真空泵單機使用於高真空範圍時期排氣性能會落在真空泵性能陡降區。如要在高真空區段獲得足夠排氣量，真空泵必須設計得更大，也必須使用更多的液封水與動力。MW機械助力式真空泵機組於液封式真空泵前段加裝大排氣量的魯式泵作為助力泵(Booster Pump)，抽氣時以液封式真空泵作為粗抽泵(Backing pump)與助力泵串聯運轉，如此可在高真空區域下得到相當大排氣量。

先進的助力泵機械式差壓控制系統

真空開關為最基本的助力泵控制方式，其缺點為整體抽氣時間長。此外若系統中瞬間壓力升高，助力泵會停止運轉，導致粗抽泵工作超出原系統規劃的抽氣量，易造成系統跳停停機。利用三錦專利的機械式壓差控制閥來控制助力泵出入口壓差，使助力泵與粗抽泵於大氣壓下能同步全速啟動，可比一般真空開關控制方式有效縮短抽氣時間提升生產效率。其次，如真空製程中壓力瞬間升高時，可保護助力泵於高壓差下運行，使真空泵不致於跳停，有助於提升真空系統運行可靠度。機械式壓差控制方式對於經常需要破真空的批次式(batch)製程或是 in-line 式製程中 loading /unloading 區段使用效果最為顯著。

高度整合的自動控制系統

MW機械助力真空泵系統所有操作及閥門控制均可自動化控制，並可和監測系統、封液回收模組等高度整合，操作使用方便。

High pumping speed in the high vacuum range enables large savings on energy costs.

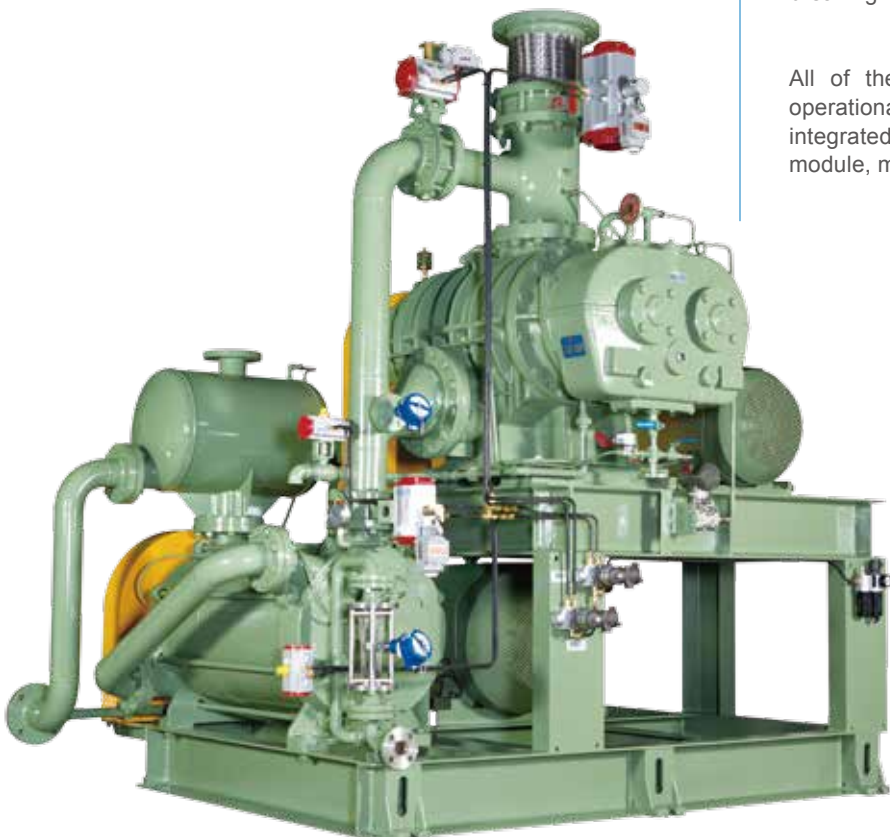
When used in high vacuum range, the gas pumping performance of a single liquid ring vacuum pump will fall in the vacuum pump performance's steep reduction zone. In order to obtain sufficient pumping volume in the high vacuum range, the vacuum pump must be designed bigger, and use more sealing liquid and power. With the MW mechanical booster vacuum pump system, a high-pumping volume booster pump (Roots pump) is installed in the front stage of the liquid ring vacuum pump. During air intake, the liquid ring vacuum pump is used as a backing pump, which is connected to a booster pump, allowing for high pumping volume in the high vacuum range.

Advanced booster pump mechanical differential-pressure valve control system.

Vacuum switch control is the most basic booster pump control method but the overall air intake time is long. Furthermore, if the pressure suddenly rises during system operation, the booster pump will stop operation and the backing pump will take in more air than originally planned, which can easily trip the system. Using Sunny King's patented mechanical differential-pressure valve to control the pressure difference in the booster pump's inlet and outlet, allowing the booster pump and backing pump to simultaneously start up at full speed under at atmospheric pressure, greatly shortening air intake time and increasing production efficiency in comparison to normal vacuum switch control method. Furthermore, if pressure suddenly rises during the vacuum process, it enables the booster pump to operate under high pressure difference, which will protect the vacuum pump from tripping and increases reliability of vacuum system operation. Mechanical differential pressure control method is particularly advantageous during the loading/unloading section of the batch process or in-line process as it often requires vacuum breaking.

Highly integrated automated system.

All of the MW mechanical booster vacuum pump system's operational and valve controls can be automated, and highly integrated with the monitoring system and sealing liquid recovery module, making operation and use convenient.



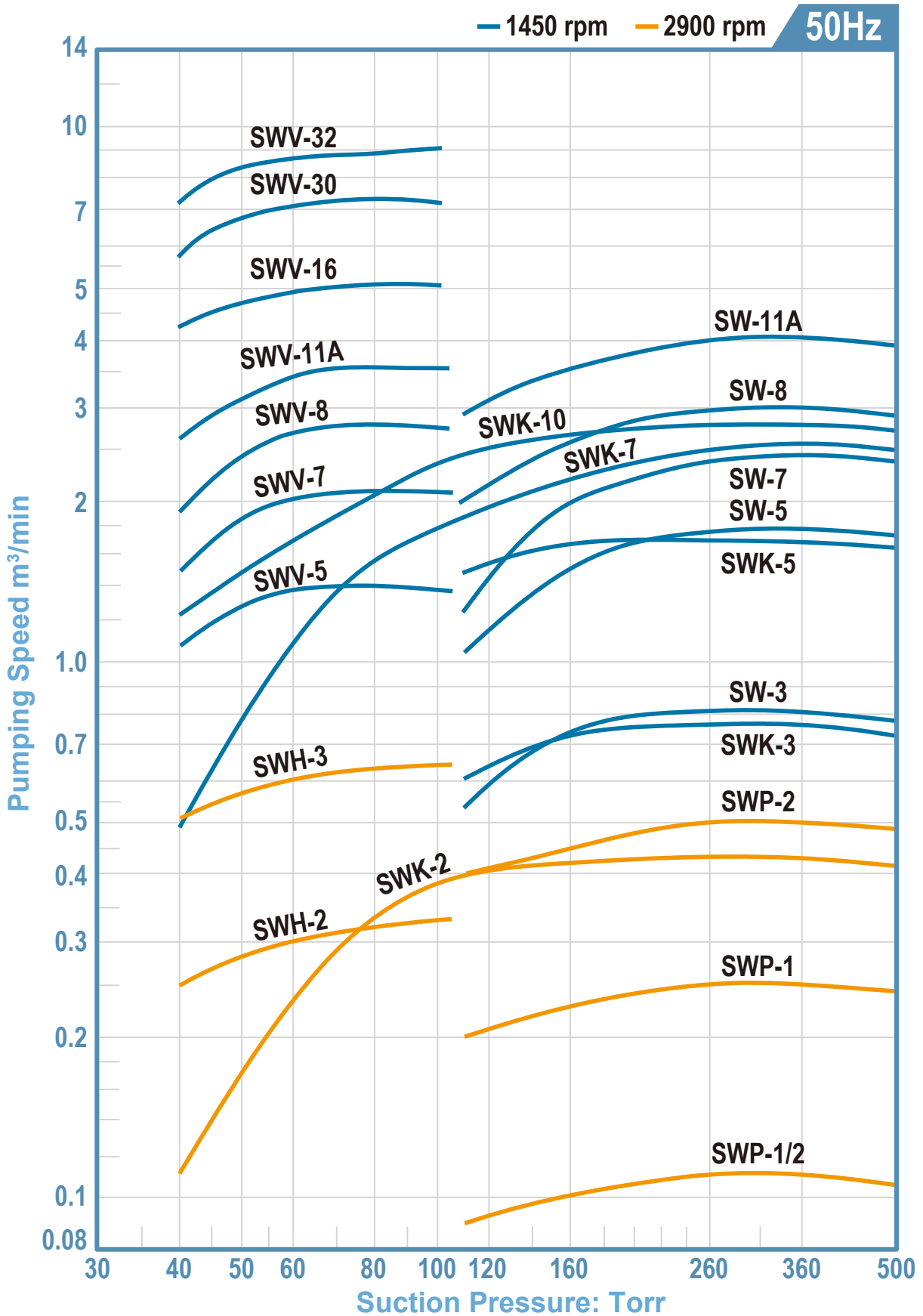
單段式性能表 Single-Stage Performance Table

型號 Model	轉數 Speed (RPM)	馬力 Power (HP)	各真空下之排氣量 (m ³ /min) Pumping Speed at Each Pressure (m ³ /min)				Connection (inch)		液封水量 Seal Water Supply (l/min)
			400mmHgG (360 Torr)	500mmHgG (260 Torr)	600mmHgG (160 Torr)	650mmHgG (110 Torr)	入口徑 Inlet	出口徑 Outlet	
SWP-1/2	2900	0.5	0.11	0.11	0.10	0.09	1	1	6
	3500	0.5	0.14	0.14	0.13	0.11			6
SWP-1	2900	1	0.25	0.25	0.22	0.20	1	1	7
	3500	1	0.30	0.30	0.27	0.24			7
SWP-2	2900	2	0.50	0.50	0.45	0.40	1	1	8
	3500	2	0.61	0.60	0.54	0.49			8
SWK-2	2900	2	0.42	0.42	0.41	0.40	1	1	8
	3500	2	0.50	0.50	0.48	0.47			8
SWK-3	1450	3	0.77	0.77	0.74	0.61	2	2	8
	1750	3	0.92	0.92	0.88	0.73			8
SWK-5	1450	5	1.68	1.71	1.69	1.50	2	2	9
	1750	5	2.02	2.05	2.03	1.80			9
SWK-7	1450	7.5	2.63	2.47	2.27	1.88	2	2	20
	1750	7.5	3.16	2.97	2.73	2.25			20
SWK-10	1450	10	2.78	2.70	2.59	2.47	2	2	27
	1750	10	3.34	3.24	3.11	2.97			27
SW-3(A)	1450	3	0.81	0.85	0.75	0.53	2	2	16
	1750	3	1.05	1.00	0.92	0.70			16
SW-5(A)	1450	5	1.77	1.77	1.45	1.08	2	2	18
	1750	5	2.20	2.19	1.88	1.42			18
SW-7(A)	1450	7.5	2.41	2.33	1.96	1.25	2	2	18
	1750	7.5	2.90	2.80	2.36	1.70			18
SW-8(A)	1450	10	3.07	2.91	2.64	1.98	2	2	20
	1750	10	3.68	3.64	3.16	2.60			20
SW-11A	1450	10	4.17	4.13	3.60	2.90	2.5	2.5	29
	1750	15	5.00	4.95	4.30	3.40			29
SW-201	1280	15	6.51	6.46	5.69	4.60	3x2	2x2	31
SW-202	1470	20	7.90	7.82	6.95	5.85			35
SW-203L	1600	25	9.20	9.10	7.92	6.63			40
SW-401L	1150	25	10.8	10.6	9.30	8.00	3x2	2x2	40
SW-401	1300	30	12.1	11.9	10.6	9.10			42
SW-402	1500	40	15.0	14.7	13.5	11.0			46
SW-501L	780	30	14.6	14.3	13.0	10.5	4x2	3x2	44
SW-501	880	40	18.3	18.1	16.1	14.3			48
SW-502	970	50	21.3	21.0	18.5	16.4			52
SW-503	1120	60	24.1	23.8	21.4	19.4			56
SW-801	690	50	23.8	23.3	22.2	20.1	5x2	5x2	50
SW-802L	750	60	26.7	26.3	24.7	22.4			60
SW-802	880	75	30.3	30.2	28.7	27.0			75
SW-1250L	530	60	30.4	30.1	27.8	23.8	5x2	5x2	80
SW-1250	590	75	32.9	32.5	30.5	26.5			95
SW-1251	700	100	41.2	40.7	37.0	31.5			110
SW-1252	800	125	47.6	46.8	42.1	37.2			125
SW-1301L	500	75	36.7	36.4	33.7	30.7	6x2	6x2	105
SW-1301	590	100	46.5	45.7	41.0	36.1			115
SW-1302	680	125	53.3	52.4	47.7	41.6			125
SW-1303	750	150	60.0	59.2	53.8	45.0			135
SW-1501L	530	100	50.3	49.5	44.0	39.1	6x2	6x2	115
SW-1501	600	125	58.8	58.0	52.6	43.8			130
SW-1502	670	150	66.2	65.4	60.1	51.6			150
SW-1503	730	175	72.8	71.9	66.7	57.4			175

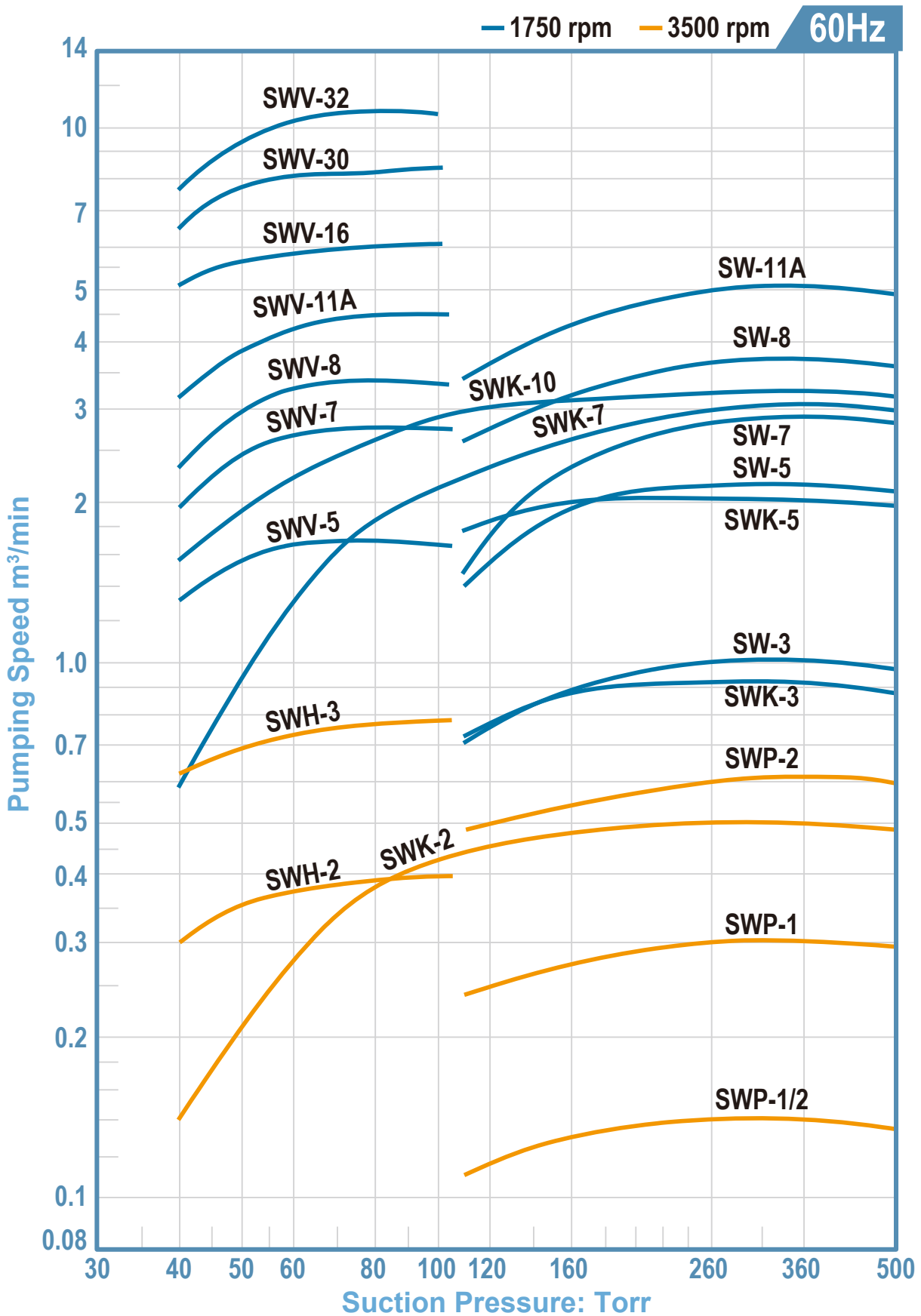
雙段式性能表 Two-Stage Performance Table

型號 Model	轉數 Speed (RPM)	馬力 Power (HP)	各真空下之排氣量 (m ³ /min) Pumping Speed at Each Pressure (m ³ /min)				Connection (inch)		液封水量 Seal Water Supply (l/min)
			660mmHgG (100 Torr)	680mmHgG (80 Torr)	700mmHgG (60 Torr)	720mmHgG (40 Torr)	入口徑 Inlet	出口徑 Outlet	
SWH-2	2900	2	0.32	0.32	0.31	0.25	1	1	5
	3500	2	0.39	0.41	0.39	0.32			5
SWH-3	2900	3	0.65	0.64	0.61	0.51	1	1	8
	3500	3	0.78	0.77	0.74	0.62			8
SWV-5(A)	1450	5	1.38	1.40	1.40	1.08	2	2	20
	1750	5	1.66	1.68	1.68	1.30			20
SWV-7(A)	1450	7.5	2.25	2.10	2.08	1.63	2	2	20
	1750	7.5	2.71	2.52	2.50	1.96			20
SWV-8(A)	1450	10	2.76	2.80	2.73	1.92	2	2	20
	1750	10	3.32	3.36	3.28	2.30			20
SWV-11A	1450	10	3.60	3.62	3.42	2.60	2.5	2.5	28
	1750	15	4.50	4.50	4.17	3.20			28
SWV-16	1150	10	4.07	3.90	3.83	3.36	2	2	38
	1450	15	4.96	5.14	5.28	4.42			38
	1750	20	6.20	5.94	5.83	5.12			38
SWV-30	1150	15	5.55	5.47	5.65	4.65	3	3	60
	1450	20	7.28	7.40	7.08	5.59			60
	1750	30	8.50	8.21	8.20	6.52			60
SWV-32	1150	20	7.05	7.07	6.71	6.18	3	3	70
	1450	25	9.10	8.71	8.60	7.15			70
	1600	30	9.98	10.3	9.45	7.33			70
	1750	40	10.9	11.2	10.4	7.68			70
SWV-211L	1050	10	4.03	4.06	3.96	3.60	3	3	35
SWV-211	1280	15	5.50	5.54	5.40	4.51			35
SWV-212	1470	20	6.30	6.37	6.09	5.50			35
SWV-410	1050	20	7.92	7.98	7.78	6.20	3	3	45
SWV-411L	1200	25	9.17	9.23	9.00	6.95			45
SWV-411	1350	30	9.96	10.1	9.84	8.15			45
SWV-521	1050	40	13.3	13.4	13.1	10.4	4	4	80
SWV-522	1200	50	15.0	15.2	14.5	11.8			80
SWV-620L	740	30	12.7	12.7	12.4	10.9	4	4	90
SWV-620	880	40	15.1	15.1	14.8	13.0			90
SWV-621	1000	50	17.0	17.0	16.2	14.3			90
SWV-622	1150	60	19.1	19.1	18.0	16.0			90
SWV-760	740	40	16.3	16.0	15.6	13.6	4	4	100
SWV-761	850	50	18.1	16.8	16.0	15.1			100
SWV-762L	950	60	19.8	20.0	19.1	17.0			100
SWV-1011L	630	60	26.6	26.6	25.9	23.0	6	6	110
SWV-1011	750	75	31.7	31.7	30.8	27.2			110
SWV-1012	840	100	35.0	35.0	33.9	30.0			110
SWV-1260	630	75	35.0	35.0	34.5	32.3	6	6	120
SWV-1261	750	100	41.5	41.7	40.8	37.0			120
SWV-1262	840	125	46.4	46.2	45.0	40.5			120
SWV-1263	900	150	49.5	49.3	47.3	42.1			120

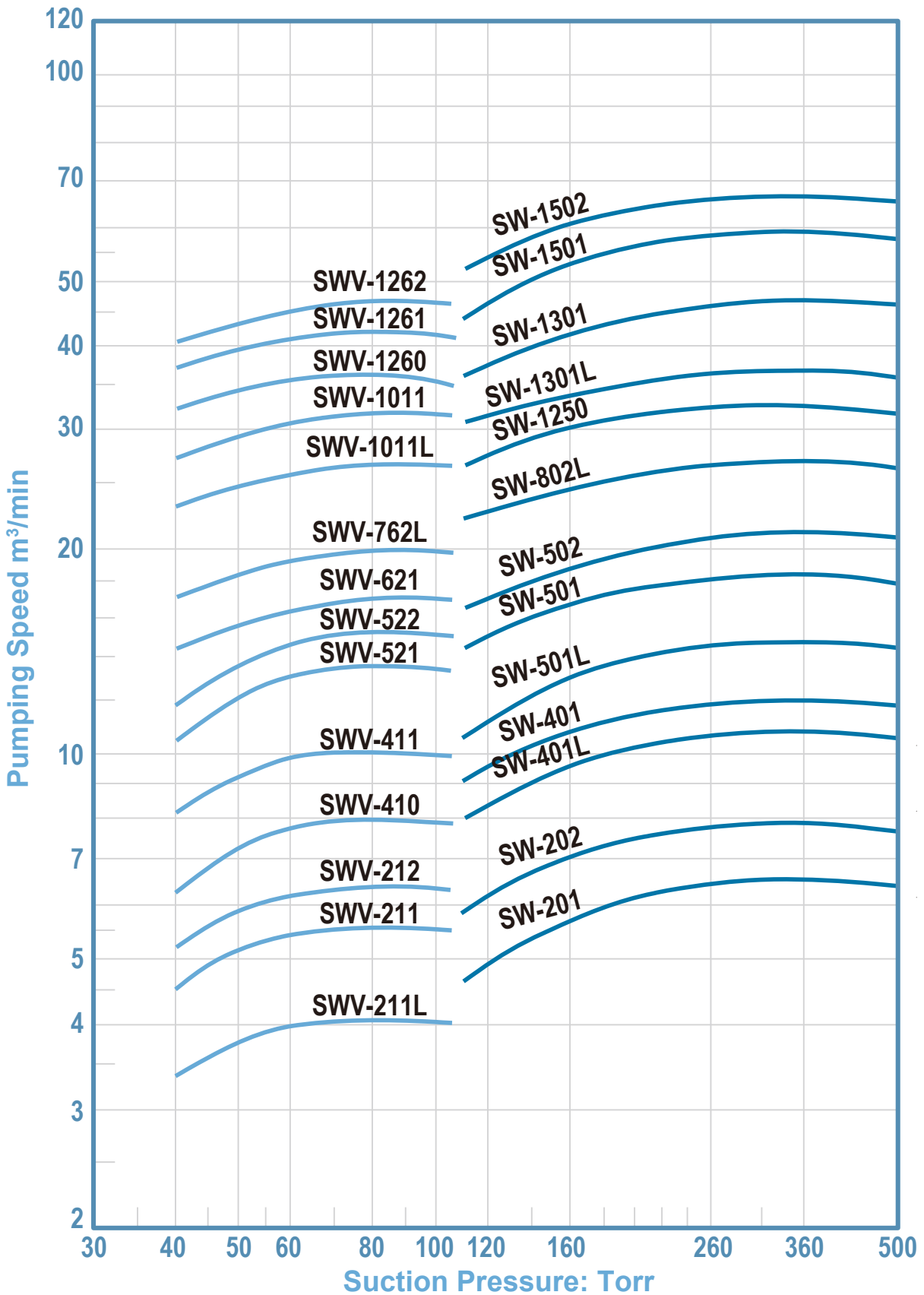
直接傳動式性能選擇表 Performance Curve Of Direct Drive Pumps



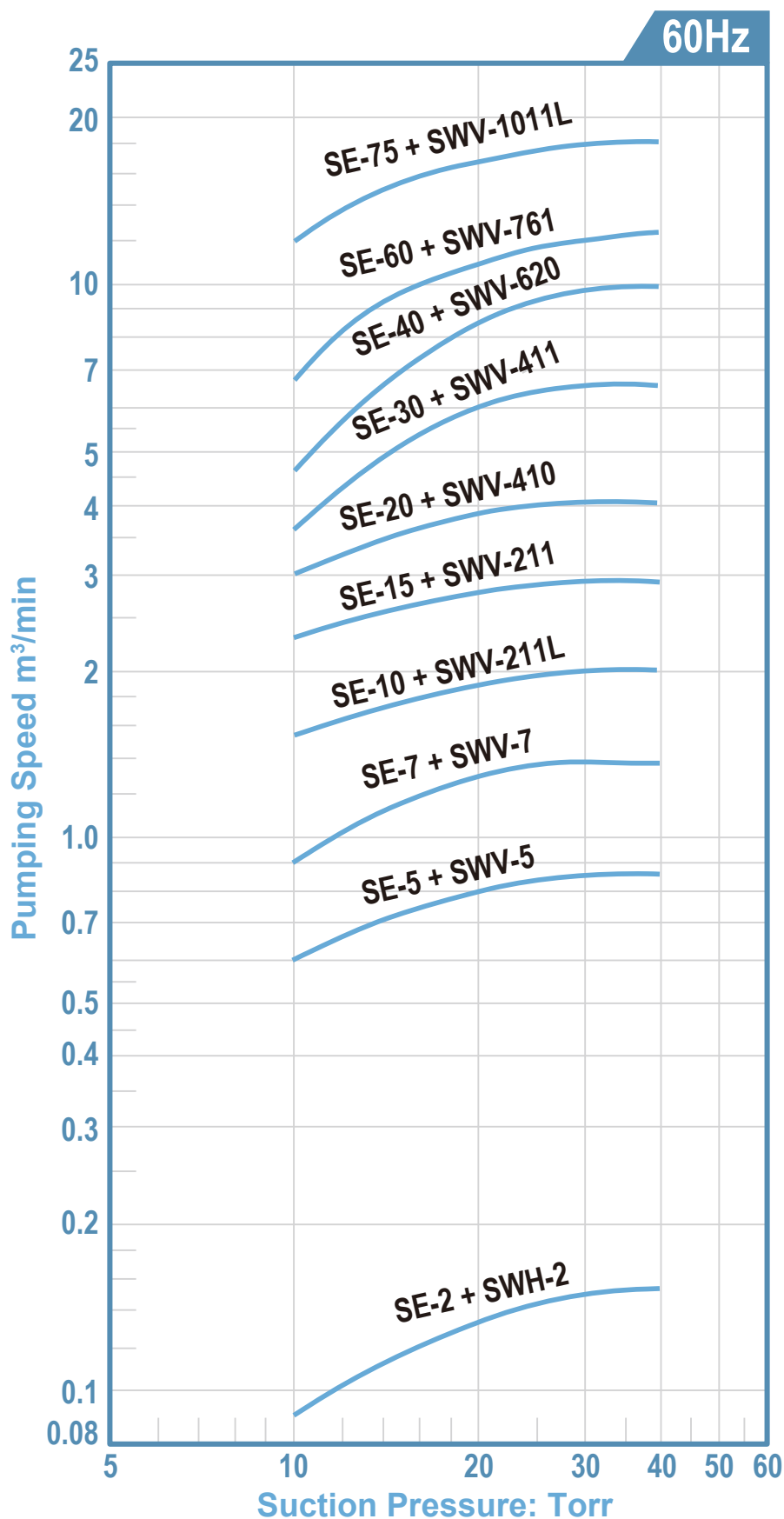
直接傳動式性能選擇表 Performance Curve Of Direct Drive Pumps



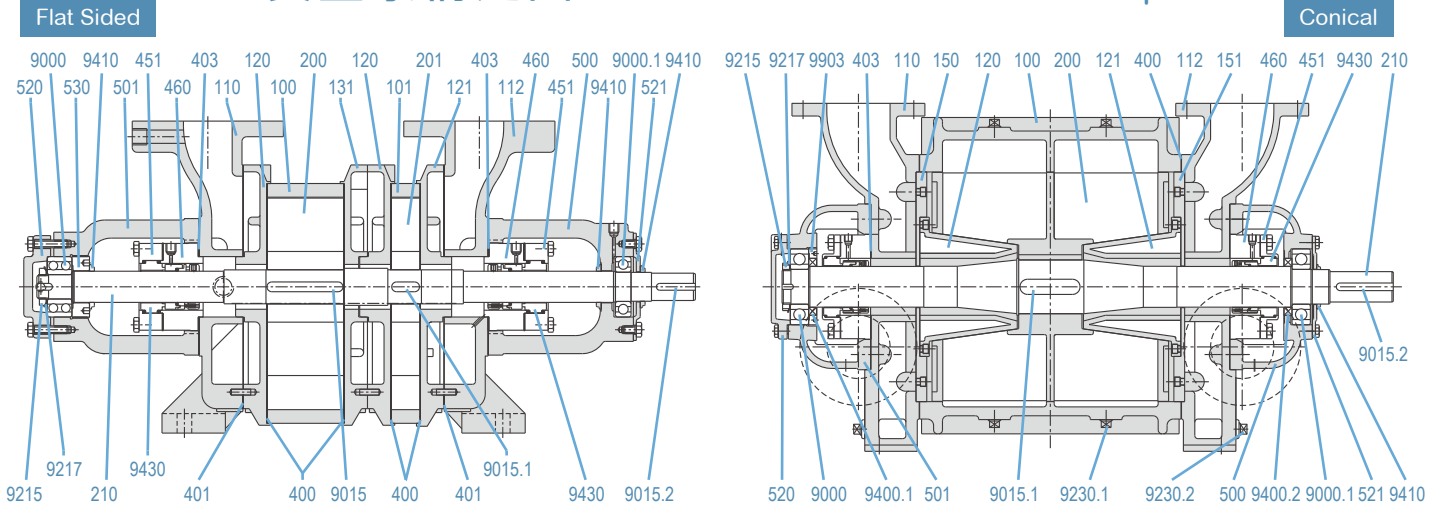
皮帶傳動式性能選擇表 Performance Curve Of Curves of Belt Drive



SWV+SE系列性能選擇表 Performance Curve with SE Air Ejector



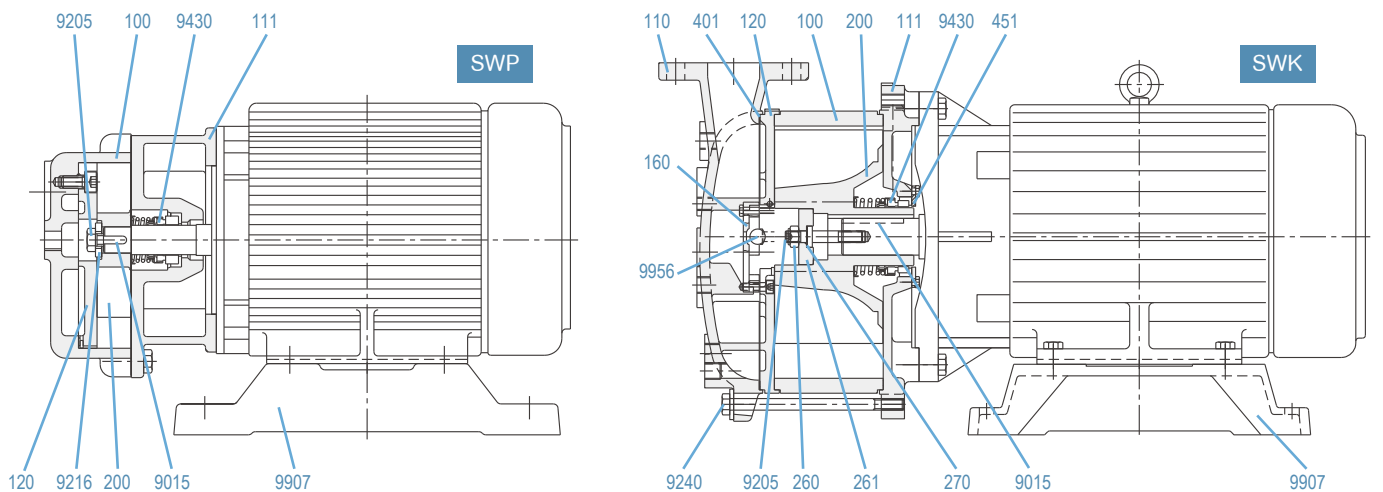
真空泵構造圖 Sectional View Of Vacuum Pump



編號 NO.	名稱 Parts Name	編號 NO.	名稱 Parts Name	編號 NO.	名稱 Parts Name
100	機殼 Casing	400	機殼墊片 Gasket, Casing	9015.1	後段葉輪鍵 Key, Rear Impeller
101	後段機殼 Casing, Rear Stage	401	托架墊片 Gasket, Head	9015.2	聯軸器鍵 Key, Coupling
110	非傳動側托架 Head, NDR	403	軸封蓋墊片 Gasket, Seal Cover	9215	軸承固定螺帽 Bearing Locknut
112	傳動側托架 Head, DR	451	軸封蓋 Seal Cover	9217	軸承固定墊圈 Bearing Lockwasher
120	非傳動側風座 Seat, NDR	460	軸封中間套 Seal Box	9230.1	旋塞 Plug
121	傳動側風座 Seat, DR	500	傳動側軸承座 Bearing House, DR	9230.2	旋塞 Plug
130	傳動側串接風座 Series Seat, DR	501	非傳動側軸承座 Bearing House, NDR	9400.1	油封 Oil Seal
131	非傳動側串接風座 Series Seat, NDR	520	非傳動側軸承蓋 Bearing Cover, NDR	9400.2	油封 Oil Seal
150	非傳動側風座固定座 Wall, NDR	521	傳動側軸承蓋 Bearing Cover, DR	9410	V型環 V-ring
151	傳動側風座固定座 Wall, DR	530	調隙螺栓 Regulation Nut	9430	機械軸封 Mechanical Seal
200	前段葉輪 Impeller, Front Stage	9000	非傳動側軸承 Bearing, NDR	9903	調隙螺栓 Regulation Nut
201	後段葉輪 Impeller, Rear Stage	9000.1	傳動側軸承 Bearing, DR		
210	軸 Shaft	9015	前段葉輪鍵 Key, Impeller		

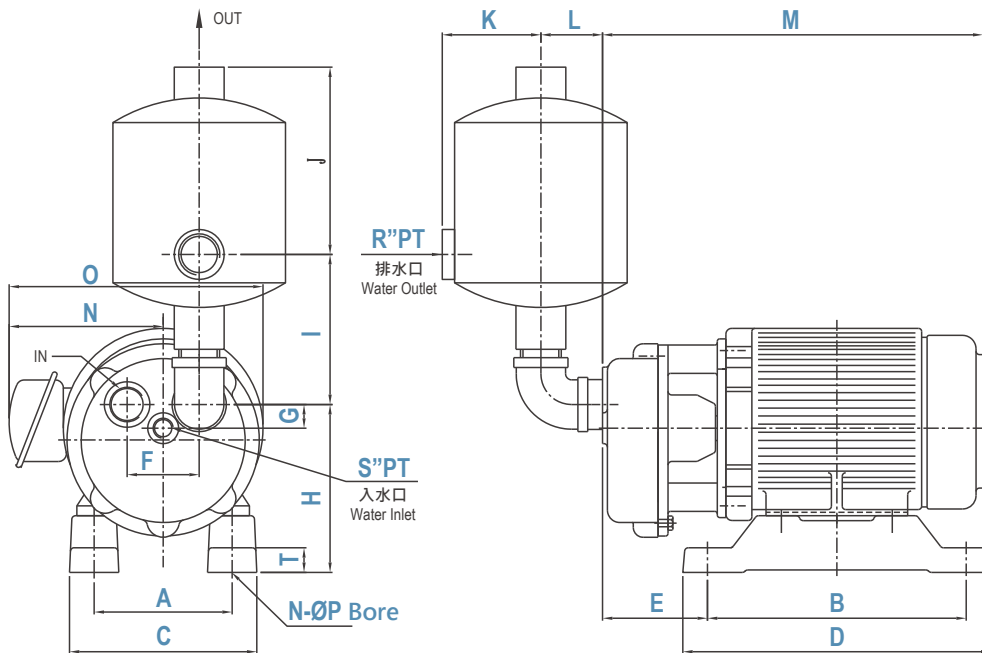
※DR=Drive Side / NDR= Non-drive Side

SWP、SWK系列構造圖 Sectional View Of SWP、SWK Series



編號 NO.	名稱 Parts Name	材質 NO.	材質 NO.	材質 NO.	編號 NO.	名稱 Parts Name	材質 NO.	材質 NO.	材質 NO.
100	機殼 Pump Housing	FC200	SCS13	SCS14	401	托架墊片 Gasket, Pump Cover	非石棉 Non-asbestos		
110	托架 Pump Cover	FC200	SCS13	SCS14	451	軸封蓋 Shaft Seal Cover	SUS304	SUS304	SUS316
111	中間支座 Adapter	FC200	SCS13	SCS14	9015	葉輪鍵 Key, Impeller	S45C	S45C	S45C
120	風座 Port Disk	FC200	SCS13	SCS14	9205	葉輪固定螺帽 Lock Nut, Impeller	SUS304	SUS304	SUS316
160	止回閥 Check Valve	FC200	SCS13	SCS14	9216	固定墊圈 Washer	SUS304	SUS304	SUS316
200	葉輪 Impeller	BC2	SCS13	SCS14	9240	公制粗牙螺絲 Screw	S45C	S45C	S45C
260	葉輪墊片 Gasket, Impeller	Teflon	Teflon	Teflon	9430	機械軸封 Mechanical Seal	According to mechanical seal type		
261	葉輪固定墊圈 Lock Washer, Impeller	SUS304	SUS304	SUS316	9907	馬達腳座 Motor Base	FC200	FC200	FC200
270	葉輪調整螺絲 Adjust Screw, Impeller	SUS304	SUS304	SUS316	9956	圓珠 Ball	Teflon	Teflon	Teflon

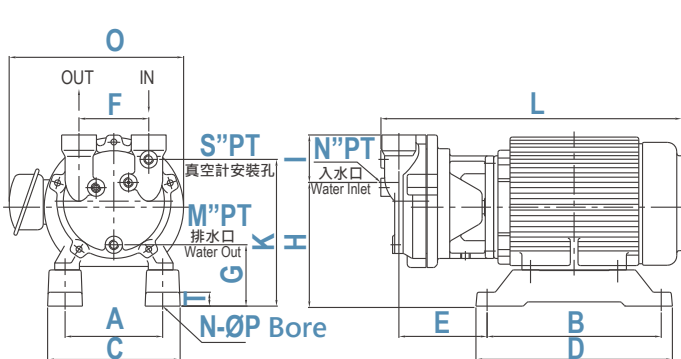
單段同軸式 Single Stage - Close Coupled



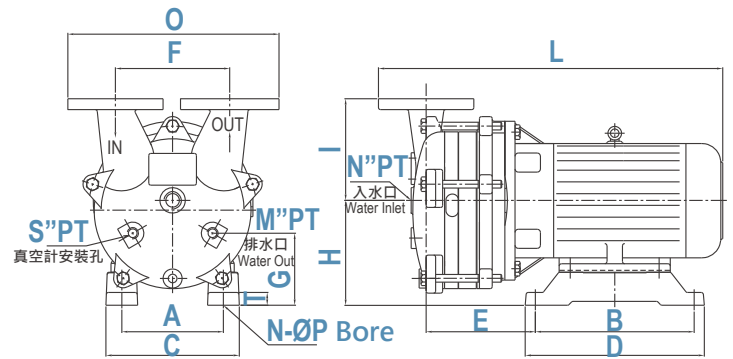
SWP1/2 ~ SWP-2

unit: mm

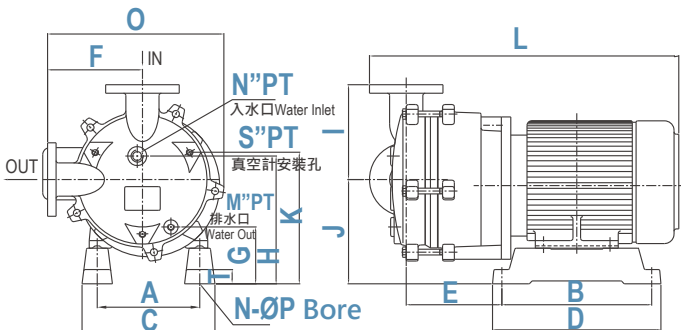
Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	N-ØP	R	S	T	備註
SWP-1/2	112	210	152	250	82	58	19	136	122	152	80	50	350	125	206	4-Ø11	1	1/4	20	R、S in Inch size
SWP-1	125	210	165	250	104	58	19	145	125	152	90	55	390	137	226	4-Ø11	1	1/4	20	
SWP-2	140	250	190	282	125	58	19	161	125	152	90	55	450	150	250	4-Ø11	1	1/4	20	



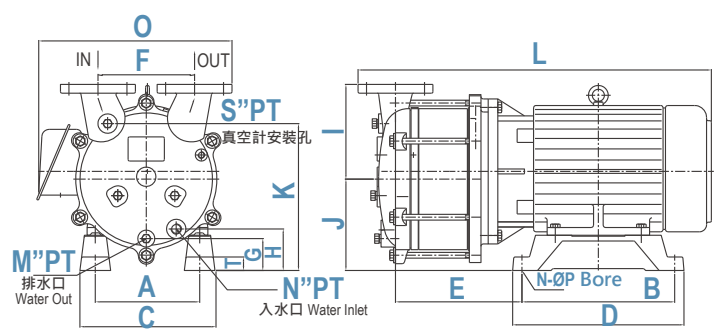
SWK-2



SWK-3 / SWK-5



SWK-7

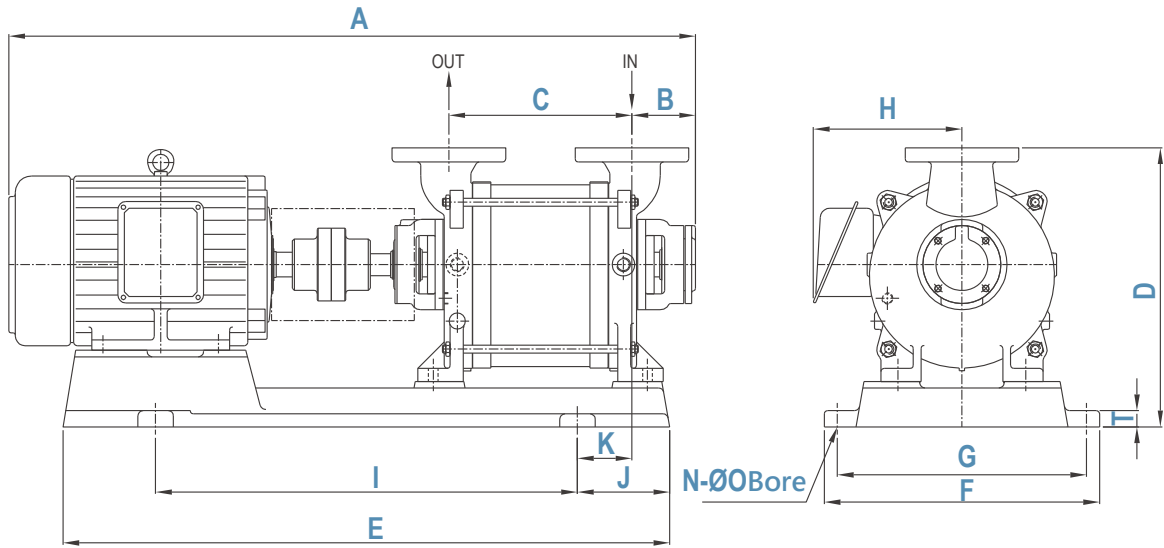


SWK-10

unit: mm

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	S	O	N-ØP	T	備註
SWK-2	140	250	190	282	127	100	88	178	68	-	210	500	1/4	1/4	1/4	300	4-Ø11	20	M、S、 N in Inch size
SWK-3	160	250	210	282	172	180	113	165	160	-	-	600	1/4	1/2	1/4	380	4-Ø11	20	
SWK-5	190	250	240	282	220	180	113	165	160	-	-	680	1/4	1/2	1/4	380	4-Ø11	20	
SWK-7	216	316	280	355	202	200	120	269	200	220	277	730	1/4	1/4	1/4	450	4-Ø15	30	
SWK-10	216	316	282	355	262	200	66	86	196	189	304	780	3/8	1/2	1/4	450	4-Ø15	28	

單段直接傳動 Single Stage - Direct Drive



SW-3(A) ~ SW-11A

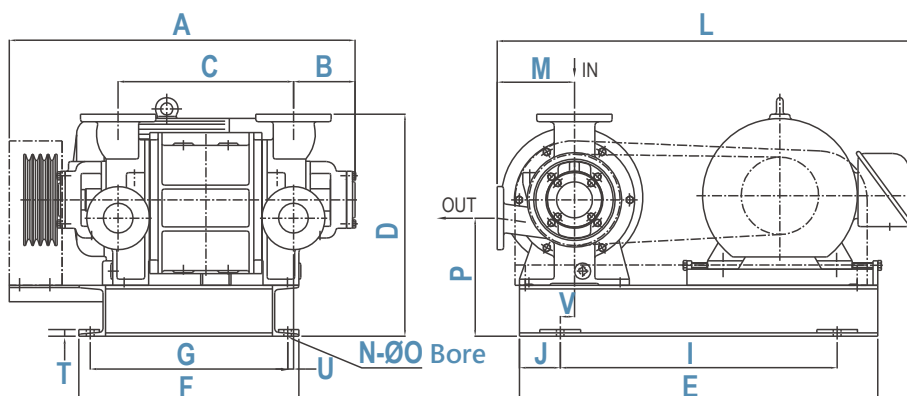
unit: mm

Model	A	B	C	D	E	F	G	H	I	J	K	N-Ø	T
SW-3	1000	189	160	390	777	350	316	250	516	130	49	4-Ø15	15
SW-5	1030	179	201	390	816	350	320	250	556	130	54	4-Ø15	20
SW-7	1150	179	236	390	886	350	320	250	633	126	58	4-Ø15	20
SW-8	1230	179	282	390	961	350	320	250	712	127	62	4-Ø15	20
SW-3A	800	97	160	390	693	352	320	250	516	88	7	4-Ø15	25
SW-5A	900	107	201	390	730	360	320	220	530	100	29	4-Ø15	20
SW-7A	1000	107	236	390	810	350	320	250	600	105	32	4-Ø15	20
SW-8A	1100	98	282	390	890	360	320	250	690	100	49	4-Ø15	20
SW-11A	1100	98	282	430	935	424	384	260	650	143	84	4-Ø19	25

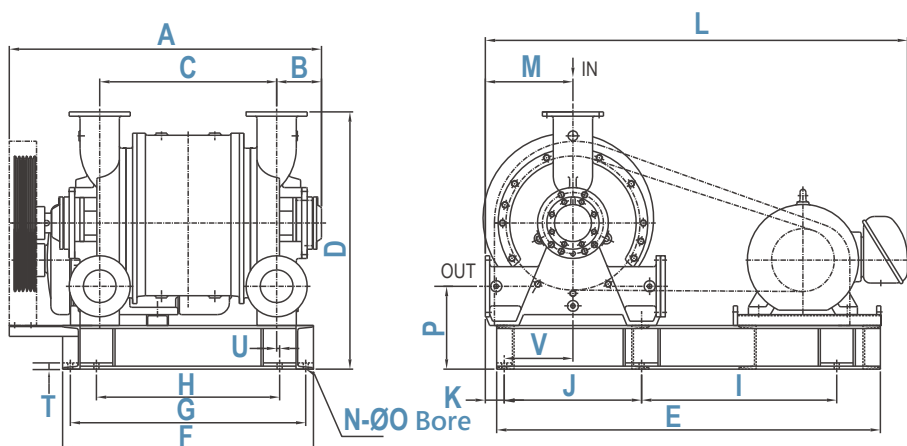


SW-3 ~ SW-11

單段皮帶傳動 Single Stage - Belt Drive



SW-201 ~SW-203L / SW-401L~SW-402 /
SW-501L~SW-502 / SW-801~802 / SW-1250L~SW-1252

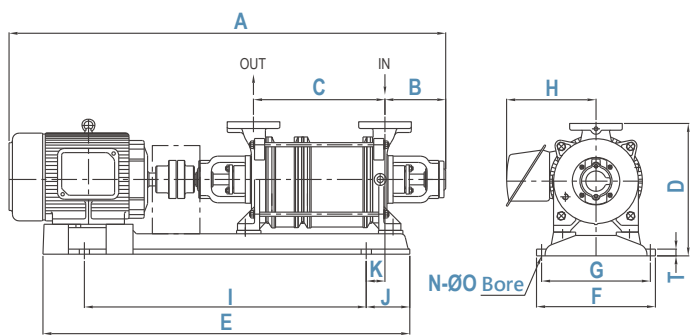


SW-1301L~SW-1303 / SW-1501L~SW1503

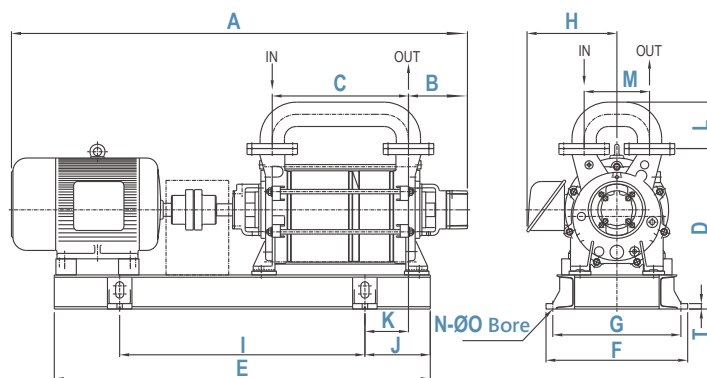
unit: mm

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	U	V	N-ØØ	P	T
SW-201	900	155	431	545	880	540	485	-	680	100	-	1075	190	17.5	35	4-Ø19	290	16
SW-202																		
SW-203L																		
SW-401L	950	158	486	560	1000	650	585	-	760	120	-	1200	210	63.5	20	4-Ø19	290	16
SW-401																		
SW-402																		
SW-501L	1050	138	606	675	1200	665	600	-	800	200	-	1450	290	34.5	10	4-Ø19	290	16
SW-501																		
SW-502																		
SW-503																		
SW-801	1300	165	715	860	1600	845	775	-	1100	250	-	1950	330	10	25	4-Ø23	425	18
SW-802L																		
SW-802																		
SW-1250L	1400	162	865	860	1600	1050	990	-	1200	200	-	2000	330	4	25	4-Ø23	425	18
SW-1250																		
SW-1251																		
SW-1252																		
SW-1301L	1450	205	812	1180	1760	1150	1080	840	895	630	87	2000	402	14	315	6-Ø23	380	28.5
SW-1301																		
SW-1302																		
SW-1303																		
SW-1501L	1600	205	882	1180	1800	1200	1130	890	935	630	87	2100	402	14	315	6-Ø23	380	21
SW-1501																		
SW-1502																		
SW-1503																		

雙段直接傳動 Two Stage - Direct Drive



SWH-2 ~ SWH-3
SWV-5(A) ~ SWV-11A

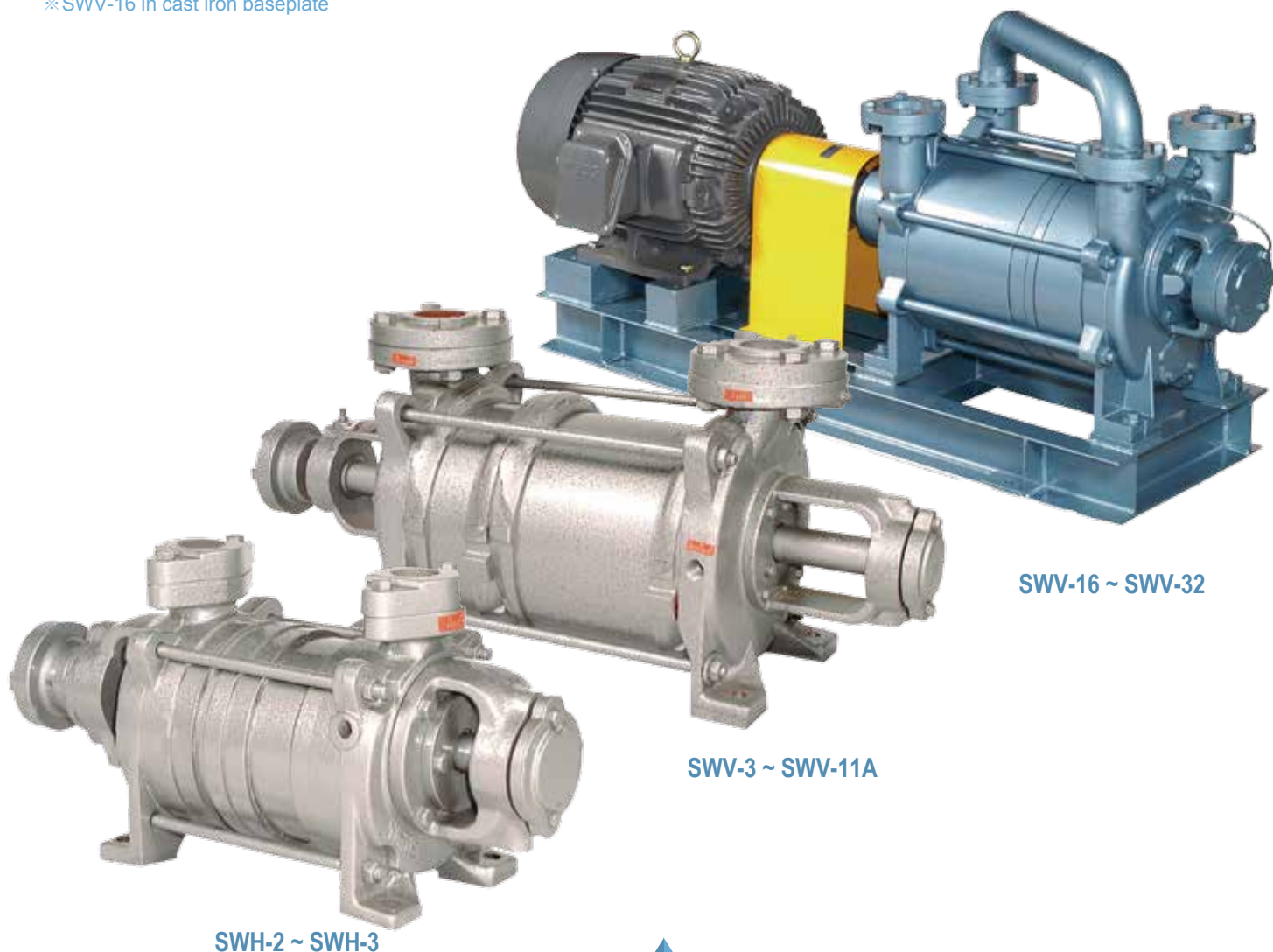


SWV-16 ~ SWV-32

unit: mm

Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N-Ø	T
SWH-2	800	105	180	245	690	265	236	180	460	113	29	-	-	4-Ø11	20
SWH-3	850	106	213	245	680	265	236	240	460	110	59	-	-	4-Ø11	20
SWV-5	1150	189	279	390	884	350	316	250	612	147	77	-	-	4-Ø15	20
SWV-7	1250	179	322	390	978	350	320	250	683	144	78	-	-	4-Ø15	20
SWV-8	1350	179	387	390	1080	350	320	300	830	128	55	-	-	4-Ø15	20
SWV-5A	950	107	279	390	800	360	320	250	612	94	28	-	-	4-Ø15	20
SWV-7A	1050	107	322	390	890	360	320	300	683	105	34	-	-	4-Ø15	18
SWV-8A	1200	107	387	390	1000	360	320	300	796	107	56	-	-	4-Ø15	20
SWV-11A	1320	98	388	470	1075	370	330	300	800	138	90	-	-	4-Ø15	10
SWV-16	1600	149	402	504	1250	510	470	350	900	175	98	112	230	4-Ø19	25
SWV-30	1750	175	500	589	1380	520	470	360	900	240	160	170	240	4-Ø19	20
SWV-32	1850	175	566	589	1490	520	470	550	1000	245	165	170	240	4-Ø19	20

※SWV-16 in cast iron baseplate

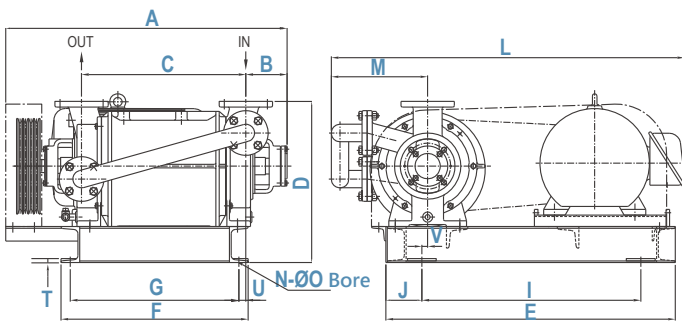


SWV-16 ~ SWV-32

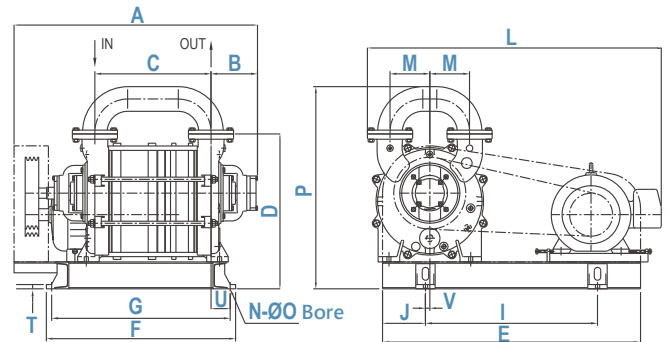
SWV-3 ~ SWV-11A

SWH-2 ~ SWH-3

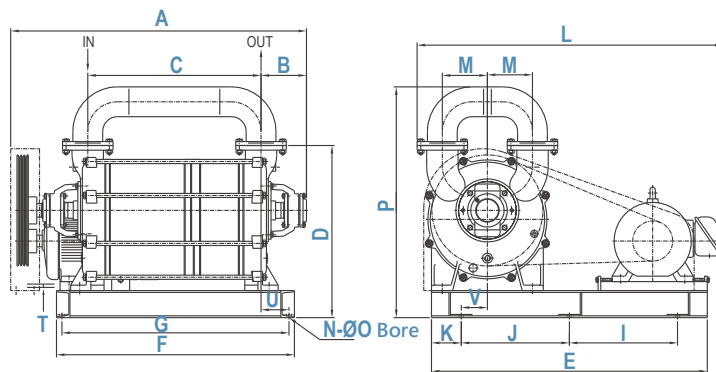
雙段皮帶傳動 Two Stage - Belt Drive



SWV-211L ~ SWV-411



SWV-521 ~ SWV-762L



SWV-1011L ~ SWV-1263

unit: mm

Model	A	B	C	D	E	F	G	I	J	K	L	M	U	V	N	O	P	T
SWV-211L	950	147	486	545	1000	650	585	760	120	-	1300	320	12.5	20	4	19	-	16
SWV-211																		
SWV-212																		
SWV-410	1000	143	570	560	1000	650	585	760	120	-	1250	334	25	20	4	19	-	14
SWV-411L																		
SWV-411	1150	216	540	720	1200	880	830	800	200	-	1450	185	89	20	4	20	940	20
SWV-522																		
SWV-620L	1300	216	690	720	1200	1030	980	800	200	-	1400	185	89	20	4	20	940	20
SWV-620																		
SWV-621																		
SWV-622																		
SWV-760	1400	216	790	720	1400	1130	1080	1000	200	-	1550	185	89	20	4	20	940	20
SWV-761																		
SWV-762L																		
SWV-1011L	1750	252	961	955	1530	1320	1260	600	600	165	1750	250	155	145	6	23	1300	18
SWV-1011																		
SWV-1012																		
SWV-1260	1800	252	1091	955	1530	1450	1375	1100	-	215	1850	250	42.5	96	4	23	1300	18
SWV-1261																		
SWV-1262																		
SWV-1263																		



SWV-211L ~ SWV-411



SWV-1011L ~ SWV-1263

客製化開發專案 *Customized Development Services*

本公司具有豐富客製化產品經驗，可針對客戶專用產品提供客製化專案開發服務。如您需要的產品規格不在型錄中或是有特別使用條件（例如特高壓力、特高黏度，或是更大或更小流量需求），請向本公司業務部門或是技術部門洽詢相關細節。

We are well experienced in customized products. Customized Development Services can be provided for exclusive products owned by the customer. In case your application is not covered by the products listed in our catalog or is subject to special operation requirements (such as ultra high pressure, ultra high viscosity, or for very large or very small flow rates), please consult our Sales Department or Technical Department for further assistance.

其他產品 *Other Products*



液封式真空泵浦
Liquid Ring Vacuum Pump



衛生泵浦
Sanitary Rotary Lobe Pump



雙軸螺旋泵浦
Twin Screw Pump



機械助力真空泵
Mechanical Booster Vacuum Pump



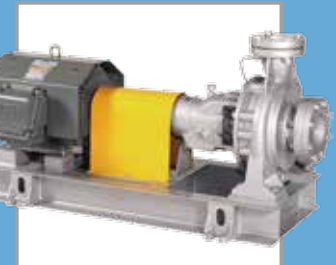
高溫熱媒泵浦
High Temperature Pump



製程級自吸泵
Self-priming Process Pump



三軸螺旋泵浦
Three Screw Pump



離心式製程泵浦
Centrifugal Process Pump



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