



單軸螺旋泵

SCREW PUMP

ONE-ROTOR SCREW PUMP



富資機械工業股份有限公司

FU-TSU MACHINERY CO., LTD.

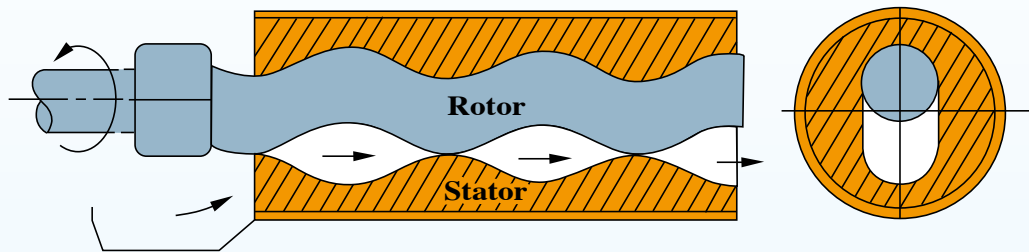


大晃機械工業株式会社 技術合作
TAIKO KIKAI INDUSTRIES CO., LTD

SCREW PUMP之構造與原理 CONSTRUCTION AND THEORY OF SCREW PUMP

是一種單軸偏心旋轉的容積型泵，由一個轉子（Rotor—金屬製品，橫切面為圓型）及一個定子（Stator—彈性材質橫切面似長圓型）組合成的簡單構造如下面所示有兩條母螺紋的定子裏，當單牙的轉子旋轉時在定子裏作上下左右反覆的運動，這時充滿在轉子和定子兩者之間所形成空間中之液體，由於轉子不斷的進行反覆運轉，得以自入口端流去而達到泵輸送的功能。

SCREW PUMP is a container type pump with a single-shaft, turning eccentrically; it is composed of a rotor and a stator shown as the following figure. The rotor is made of metal with circular cross section, while the stator is of elastic material with long circular cross section. The rotor is inside the stator. When the rotor rotates liquid between rotor and stator will be forced to move from inlet to outlet. Then, the purpose of transporting liquid is achieved.



SCREW PUMP之特點 CHARACTERISTICS OF SCREW PUMP

1. 能處理高低粘濃度和含有半固形物的液體，應用範圍廣。
2. 能吸泥狀液體。
3. 能在無脈動情形下達到定量輸送，不產生渦流或攪拌。
4. 低流量運轉時，亦可產生高吐出壓力。
5. 可利用調速裝置，變化流量。
6. 運轉時寧靜無噪音。
7. 結構簡單、零件少、容易操作及保養。
8. 大吐出量，轉子經與一般同尺寸的泵相比，其能量可超出1.5~1.6倍。

1. Wide application range-can handle liquid with high/low viscosity or with semi-solid content.
2. Can suction muddy liquid.
3. Constant transport rate without pulse, vortex or mixing.
4. High discharge pressure even at low flow rate.
5. Can control flow volume by adjusting rotation speed.
6. Quiet running operation.
7. Simple construction, easy to operate and maintain.
8. High discharge capacity can be 1.5~1.6 times more than that of the others with the same size rotor.

型式選擇參考表

TYPE SELECTION REFERENCE

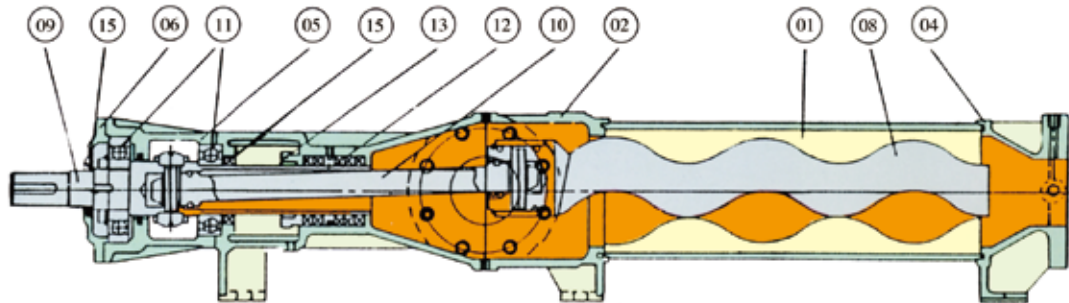
用途 Application	型式 Type	構造與特徵 Construction and Characteristic	
<p>輸送污水、油粕、紙漿、水泥漿、廢油、重油、土木建築、礦業、高分子凝集劑、石灰、污泥、塗料、肥皂液…等。</p> <p>Transport dirty water, oil, liquid paper, concrete water, polluted water, heavy oil, building industry, mining industry, linedirty mud, paint, soap liquid, etc.</p>	HNP	<p>基本型，應用範圍廣，以GLAND PACKING為軸封，以梢子為撓性接頭，易於保養，接液部份為鑄鐵製。</p> <p>Basic type, wild application, GLAND PACKING shaft seals, with pin as flexible connection, easy to maintain, parts contacting liquid area made of cast iron.</p>	
<p>輸送塗料、化妝品、化學紙漿、製糖、食品、農水產、窯業、魚油、船舶、污泥、下水道尿處理及其他各種工業用。</p> <p>Transport paint, cosmetic, chemical industry, liquid paper, sugar-making, food, farm/marine products, kiln industry, fisk oil, boat, dirty mud, underground, urine processing, etc.</p>	HNG	<p>有GLAND PACKING為軸封及機械軸封兩種，以梢子為撓性接頭，並包覆橡膠套易於保養，接液部份為不銹鋼製。</p> <p>GLAND PACKING shaft seals or mechanical seals, with pin as flexible connection, and package of rubber cover, easy to maintain, parts conacting liquid are made of stainless steel.</p>	
<p>輸送果汁、飲料、巧克力、果醬、沙拉醬、化妝品、製藥及其他各種食品、化學工業用。</p> <p>Transport juice, drink, chocolate fruit jam, salad jam, cosmetic, medicine, food industry, and chemical industry.</p>	HNC	<p>衛生型接液部份為不銹鋼製，以油封為軸封且結構簡單而易於拆解，檢修、清理。整個內部之清理、只要鬆開三個螺絲即可。</p> <p>Hygienic type, parts contac ting liquid are made of stainless steel, oil, seals, simple construction for easy maintenance, disassembly and cleaning by loosing 3 screws, you can clean the whole inside.</p>	
<p>輸送魚醬、肉醬、豆粕、水泥漿、槽沈積物、脫水污泥、塗料、水產加工、釀造漬物、土木建築及其他各種工業用。</p> <p>Transport fish jam, minced meat, concrete water, through deposit dirty water, paint, marine products, fermentation deposit, building industry, etc.</p>	HNF-A	<p>本體內部有螺旋填料裝置為推入型，適用於輸送半固型物質，但半固型物質在半固型物質在輸送中易堆積在傾斜漏斗型之入口，形成阻塞，所以宜考慮裝置去除阻塞之設施。</p> <p>Push type, inside spiral feeding device, suitable for transporting semi-solid material. While semisolid materials usually stay at the inlet of funnel shape, it was s-uggested that some additional device for removing obstruction materials is necessary.</p>	
<p>輸送脫水污泥（水含量90%以上）纖維塊、蜜餞漿、高濃度紙漿、榨汁後果渣、魚渣、家畜糞及其他工業用。</p> <p>Transport dirty water (with 90% water), fibre block, syrup, thick liquid paper, fruit dregs, fish dregs, dung, etc.</p>	HNF-B	<p>在螺旋填料裝置上方有一組、阻塞破解器，以利於輸送，低流動性的半固型物質，接液部份有不銹鋼製及鑄鐵製兩種。</p> <p>Over the spiral feeding device, there is an obstruction removing device which is used to transport semisolid materials, parts contacting liquid are made of stainless steel of cast iron.</p>	

容量 Capacity	轉子直徑(mm) Rotor Diameter		吐出壓力 Discharge Pressure	段數 Stage No.
0.2 ~ 1m ³ /hr	2	0	0 ~ 5kg/cm ²	1
0.5 ~ 3m ³ /hr	3	0	0 ~ 12kg/cm ²	2
2 ~ 10m ³ /hr	4	0		
3 ~ 30m ³ /hr	6	0		
10 ~ 80m ³ /hr	8	0		

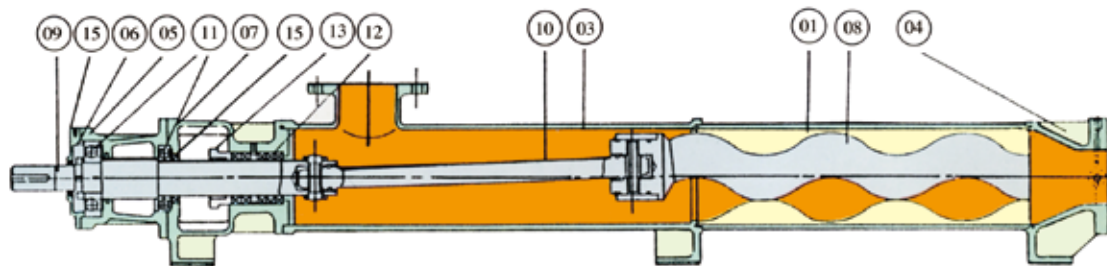
構造與材質表

Construction and Material

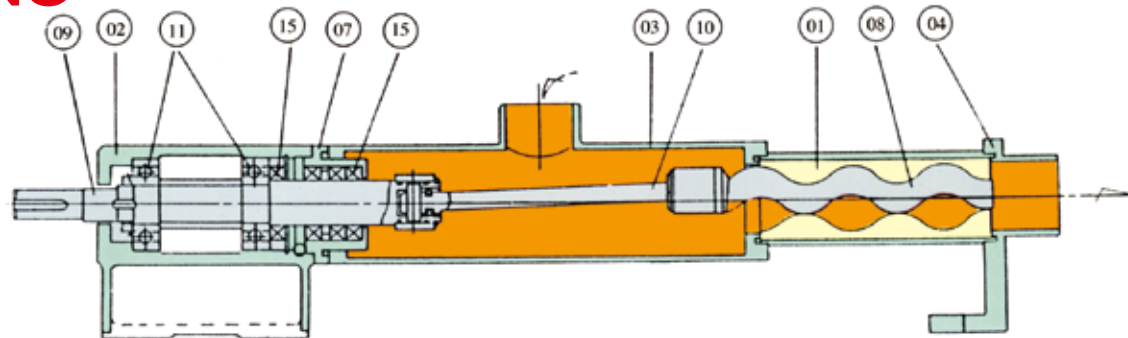
HNP



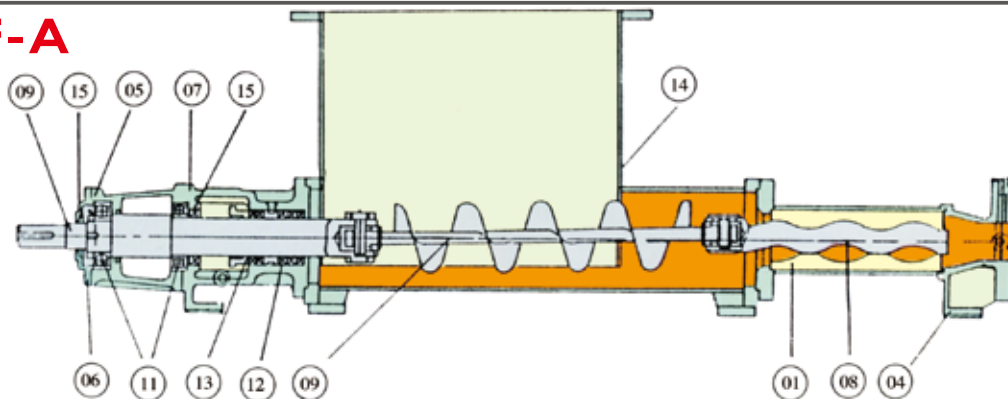
HNG



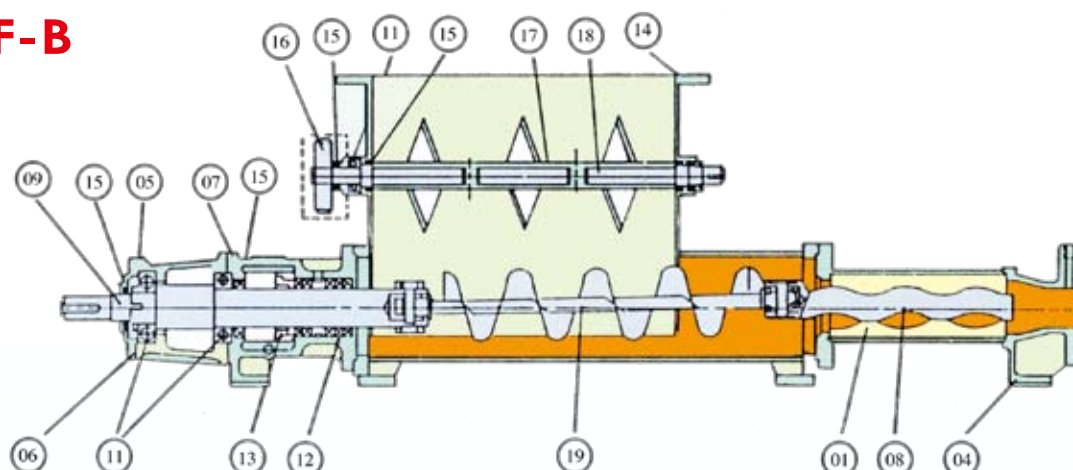
HNC



HNF-A



HNF-B

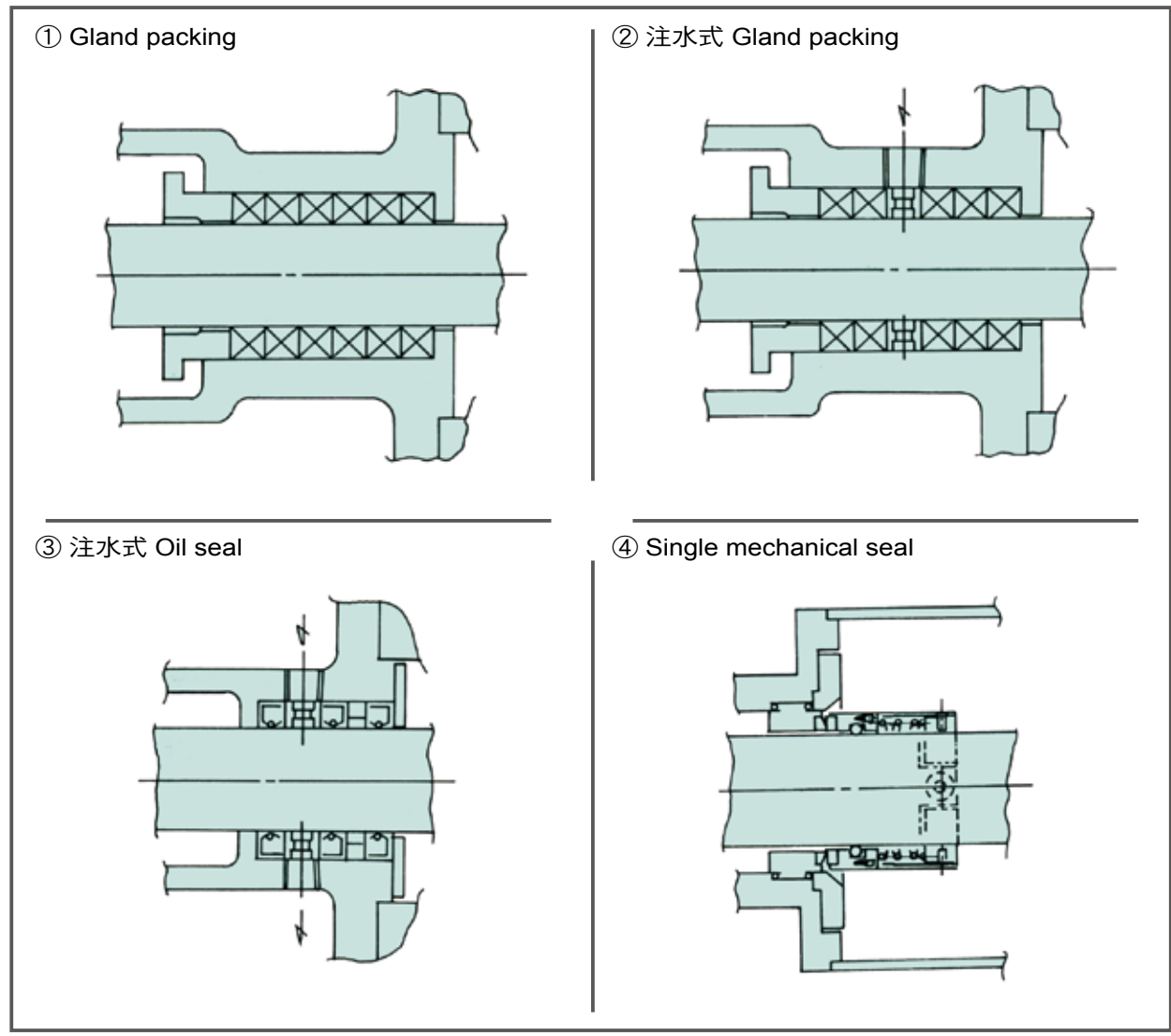


No.	部品名稱 PART NAME	材質 Material	No.	部品名稱 PART NAME	材質 Material
01	Stator / 定子	★	11	Bearing / 培林	SUJ 2
02	Pump Stand / 本體	FC 20	12	Gland Packing / 格蘭迫緊	Semi Metallic
03	Pump Case / 泵浦箱	★	13	Gland / 格蘭	FC 20
04	End piece / 尾座	★	14	Feed Case / 進料桶	SUS 304
05	Bearing Case / 培林箱	FC 20	15	Oil Seal / 油封	NBR
06	Bearing Cover / 培林蓋	FC 20	16	Pilot Gear / 齒輪	SCM 21
07	Seal Case / 油封箱	FC 20	17	Bridge Breaker / 架橋破壞器	SUS 304
08	Rotor / 轉子	★	18	Bridge Breaker Shaft / 架橋破壞軸	S45C
09	Shaft / 傳動軸	SUS 304	19	Feed Rod / 螺旋連結桿	SUS 304
10	Connecting Rod / 連結桿	SUS 304	20		

★ 材質組合表 MATERIALS(PARTS SHOWN ★)

PUMP CASE / 本體	END PIECE / 尾座	ROTOR / 轉子	STATOR / 定子
FC 20 SUS 304 SUS 316	FC 20 SUS 304 SUS 316	SUS 304 SUS 316	NR NBR CSM IIR VITON

軸封構造圖 Construction of shaft seals



軸封一覽表 Shaft seals list

軸封構造圖 Construction of shaft seals	①	②	③	④
HNP	○	△	△	△
HNG	○	△	△	△
HNC	○	△	△	△
HNF-A	○	△	△	△
HNF-B	○	△	△	△

△ 特殊式樣 Special Type

○ 標準式樣 Standard Type

型號及馬力參考表 List of Type and Power for Reference

Type	Capa m ³ /hr	Total Press. kgf/cm ²	rpm	Motor kw			
				Viscosity cst			
				200	1000	3000	
201	0.3	2	240	0.75			
		3	300				
		4	380				
		5	450				
		6	300				
		8	380				
202		10	450	1.5			
		12	530				
201	0.5	2	300	0.75			
		3	360				
		4	430				
		5	500				
		6	360				
		8	430				
202		10	500	1.5			
		12	600				
401	4	2	200	1.5			
		3	230				
		4	250				
		5	280				
		6	220		2.2		
		8	250				
402		10	280	3.7			
		12	330	5.5	7.5		
401	5	2	240	1.5			
		3	270				
		4	290				
		5	330		2.2		
		6	270				
		8	290				
402		10	330	5.5			
		12	370			7.5	
601	20	2	290	3.7		5.5	
		3	310		5.5		7.5
		4	320				
		5	360		7.5		
		6	310				
		8	320				11
602		10	360		15	18.5	
		12	380	18.5		22	
601	30	2	430	5.5			
		3	440		7.5		
		4	460		7.5	11	
		5	490		11		15
		6	440				
		8	460		15	18.5	
602		10	490	18.5	22	30	
		12	580	22		30	
801	20	2	130	5.5			
		3	150				
		4	160				
		5	180				
		7.5			7.5		11
		11					
801	30	2	190	5.5		7.5	
		3	200				
		4	210	7.5			
801	40	2	240	5.5	7.5		
		3	250	7.5		11	
		4	270				
801	50	2	290	7.5		11	
		3	310				
		4	320			15	
801	65	2	380			15	
		3	380	11	15	18.5	
		4	400	15	18.5		37
801	80	2	450				
		3	460	15		18.5	
		4	480	18.5			22

選擇過程 Selection process

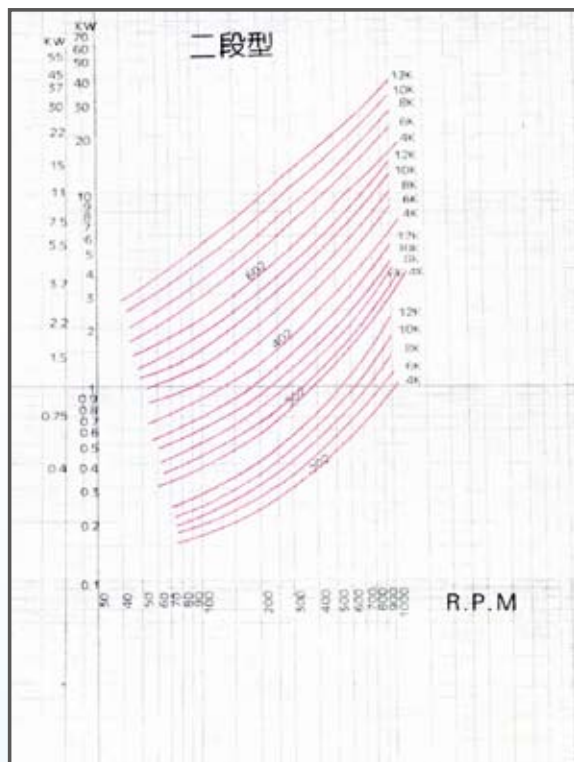
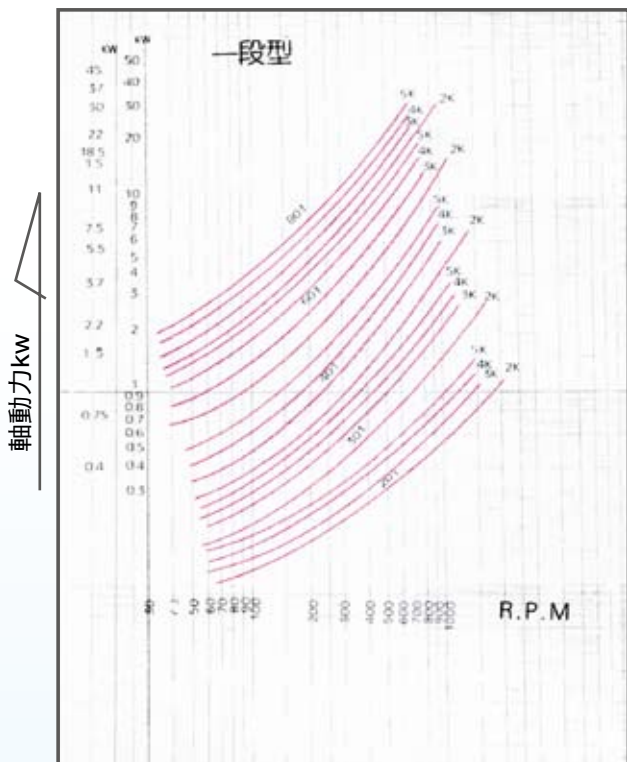
污水 Dirty water

範例	Example
容量 Capacity	1m ³ /HR
粘度 Viscosity	3000 cst
全壓力 Total Pressure	3kgf/cm ²

- 依參考表HNP-201，530迴轉數為最初之選擇。因污水磨耗性高，所以其轉數需低於400RPM（請看參考資料）因此選擇HNP-301，240rpm，1.5KW。
- The reference list, HNP-201 with 530 rpm would be the primary selection. Because of the leigh abrasion of dirty water, rotation speed will be lower than 400 rpm(perference). Therefore the final selection is HNP-301, 240rpm, 1.5KW.

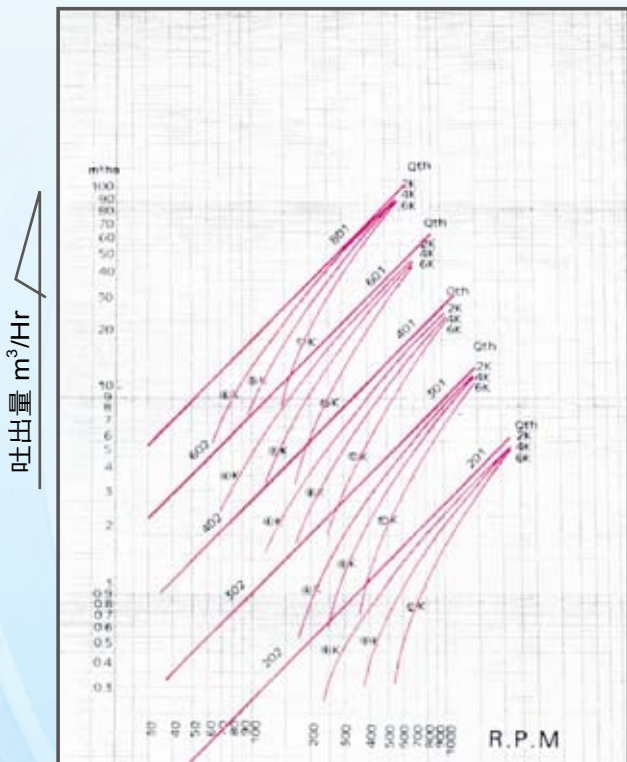
予想軸動力

Supposed shaft power one stage revolution



予想吐出量

Supposed Discharge capacity



馬達建議之最低出力

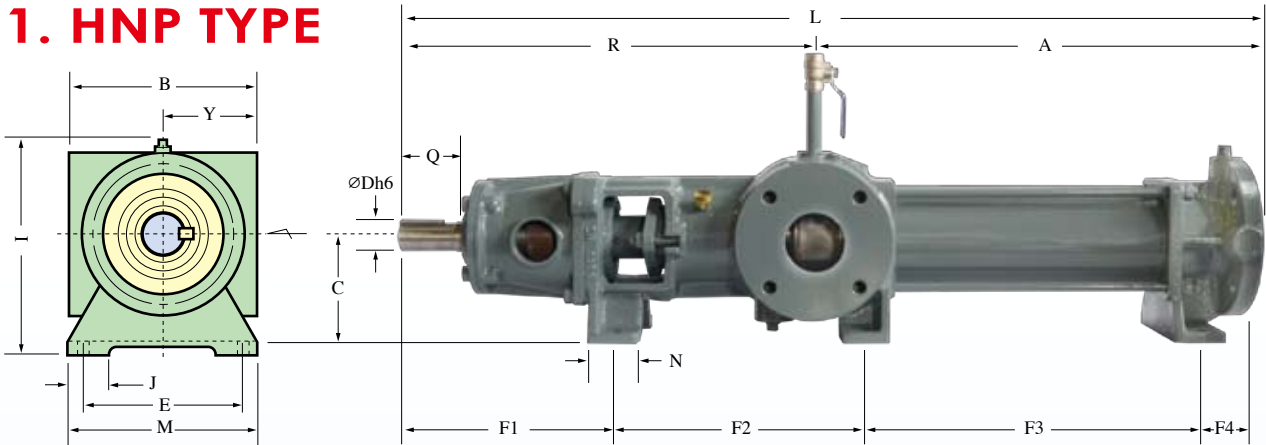
Minimum output for motor

型號	KW
201	0.75
202	
301	1.5
302	
401	2.2
402	
601	3.7
602	
801	5.5

泵浦本機尺寸圖表

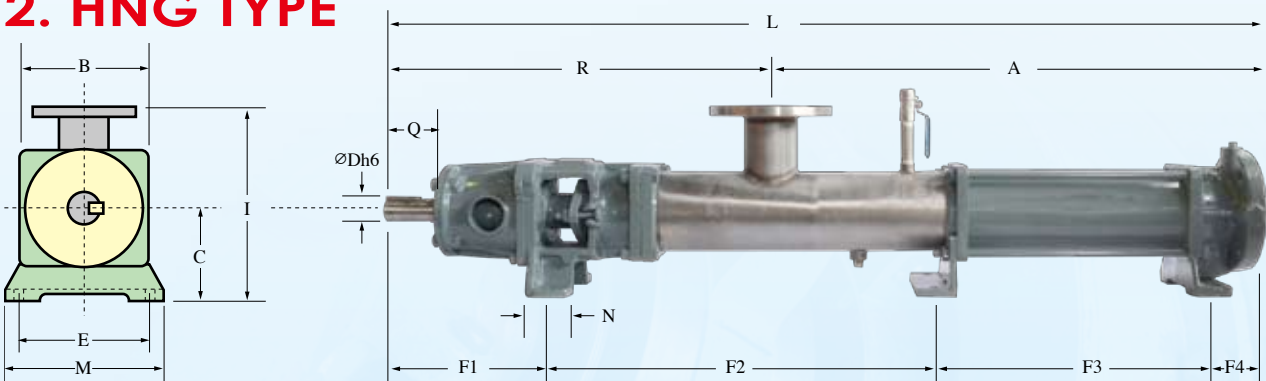
Dimensions of pump body

1. HNP TYPE



Type	Bore	DIMENSION																
		A	B	C	D	E	F1	F2	F3	F4	I	J	L	M	N	Q	R	Y
HNP 201	PF 1½B	255	120	90	19	100	195	80	250	30	160	35	555	130	45	45	300	60
HNP 202		375			24		210		370				50			315		
HNP 301	JIS 10K 50A	405	170	100	28	140	220	260	290	60	195	40	830	170	50	50	425	85
HNP 302		485			32		250		470				63			455		
HNP 401	JIS 10K 65A	498	170	112	32	140	250	275	378	65	225	40	968	170	55	63	470	85
HNP 402		754			42		280		634				71			500		
HNP 601	JIS 10K 80A	698	190	132	42	180	280	400	508	75	245	40	1263	210	55	71	565	95
HNP 602		1058			48		315		868				80			600		
HNP 801	JIS 10K 100A	880	280	160	48	250	330	530	680	100	315	60	1640	300	80	80	760	140

2. HNG TYPE



Type	Bore	DIMENSION														
		A	B	C	D	E	F1	F2	F3	F4	I	R	M	N	Q	L
HNG 201	PF 1½B	340	60	90	19	100	195	320	195	30	150	400	130	45	57	740
HNG 202		485			24 \varnothing		210	345	315			415			61	900
HNG 301	JIS 10K 50A	570	155	100	28 \varnothing	140	220	485	300	60	220	495	170	50	56	1065
HNG 302		774			32 \varnothing		250	535	480			550			76	1324
HNG 401	JIS 10K 65A	684	175	112	32 \varnothing	140	250	530	388	65	262	550	170	55	76	1234
HNG 402		940			42 \varnothing		280	530	644			580			85	1520
HNG 601	JIS 10K 80A	840	185	132	42 \varnothing	180	280	649	523	75	282	687	210	55	85	1527
HNG 602		1270			48 \varnothing		315	717	883			720			100	1990
HNG 801	JIS 10K 100A	1192	210	160	48 \varnothing	250	330	842	700	100	355	780	300	80	100	1972

參考資料 REFERENCE

依磨耗性選擇回轉數：

- 下表列出代表液體名稱，依此表可判別使用液之磨耗性，又濃度與溫度致液性會產生變化請參考。
- 當型號變大時，選擇低迴轉數。

Select Revolution No. by Abrasion :

- The following table lists some representative liquids. From this table, you can judge the abrasion of the liquid you use. Please note that liquid's characteristics will change due to density and temperature.
- Select low revolution when type increases.

液之磨耗性 Abrasion	液體種類 Liquid	回轉數 Rotation Speed
輕微 Low	清水、脫離液、高分子凝集劑、油、果汁、肉醬、肥皂液、血液、甘油、油漆。 Water, escapeoil, oil, juice, minced meat, soap liquid, blood, glycerine, uarnish.	400 ~ 700以下 Under 400 ~ 700
中等 Middle	殘剩汙泥、浮渣、工廠汙水、油墨泥、魚、紙漿液、塗布顏料泥水、碳酸鈣、米糠。 Dirty mud, dregs, dirty water, printing mud, liquid paper, Painting mud, calcium carbonate fish, bran.	200 ~ 400以下 Under 200 ~ 400
高(強) High	消化汙泥、石灰泥、黏土、陶土、水泥漿、白土。 Dirty mud, lime mud, clay, potter's caly, cement mud, water soil.	50 ~ 200以下 Under 50 ~ 200

固體物最大粒徑

Select Rotation Speed by Viscosity

泵型號 Pump Type No.	最大粒徑m/m Max Diameter of Particle
20	5
30	7.5
40	10
60	15
80	20

- 在此範圍之固體物不致損壞其粒子，亦不會阻塞輸送，軟質固型物其粒子值大2~3倍亦可輸送。
- Solid particles in this rang won't be destroyed or to obstruct the transportation. The diameters can be 2~3 times the above for soft solid particles.

依輸送壓力選擇段數

Select stage by Transport Pressure

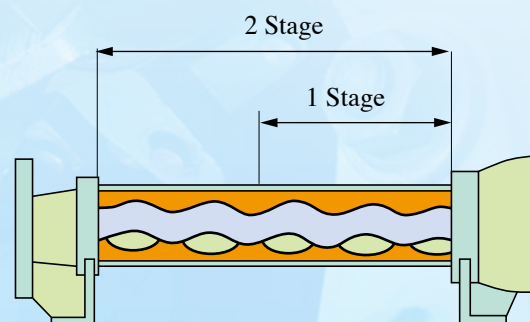
液之磨耗性 Abrasion	1段 Stage 1	2段 Stage 2
輕微 Low	6 kgf/cm ²	12 kgf/cm ²
中等 Middle	4 kgf/cm ²	8 kgf/cm ²
高 High	2 kgf/cm ²	4 kgf/cm ²

依黏度選擇回轉數

Select Rotation Speed by Viscosity

液體黏度 Liuqid Viscosity	回轉數 Rotation Speed
1 ~ 1,000 cp	400 ~ 700 rpm以下 Under 400 ~ 700 rpm
1,000 ~ 10,000 cp	200 ~ 400 rpm以下 Under 200 ~ 400 rpm
10,000 ~ 100,000 cp	200 以下 Under 200 rpm
100,000 ~ 1,000,000 cp	100 以下 Under 100 rpm

- 選擇回轉數有種種關係，必須要以經驗來決定，上列數值僅供於參考，最後且需與敝廠配合決定。
- Many factors influence the rotation speed selection, and it depends on experiences. The above information is only for reference. Please contact us for the final decision.



定子橡膠耐性表 Resistance Table for Stator(Rubber)

◎ 非常適用 ○ 適用 △ 尚可 × 不適用	最高使用溫度 °C (耐熱性) Max. Allowable Temperature	耐老化性 Resistance to Fatigue	水 Water	有機酸 Organic Acids	強酸 Strong Acid	弱酸 Weak Acid	強鹼 Strong Alkali	弱鹼 Weak Alkali	汽油 Gasoline Light Oil	苯、甲苯 Benzene	酒精 Alcohol	潤滑油 Lubricant	磷酸鹽系油 Salt Phosphate Series Oil	矽酸鹽系油 Salt Silicate Series Oil
	NR 天然膠 NR(Natural Rubber)	70°C	◎	×	×	○	○	△	×	×	◎	×	×	×
	NBR 耐油膠 NBR(Nitric Rubber)	80°C	◎	×	○	○	○	○	◎	×	◎	△	×	△
	CSM 耐熱膠 CSM(Hypalon)	90°C	◎	×	◎	◎	◎	◎	×	×	◎	×	×	○
	IIR 丁基橡膠 IIR(Butyl)	90°C	◎	△	◎	◎	◎	◎	×	△	◎	×	×	×
	VITON 氟化橡膠 FKM(Viton)	270°C	◎	×	◎	◎	×	△	◎	◎	◎	◎	○	○

主要液體粘度表 List of Primary Liquid Viscosity

液體種類 Liquid	溫度 (°C) Temperature	粘度 (CP) Viscosity	液體種類 Liquid	溫度 (°C) Temperature	粘度 (CP) Viscosity
巧克力 Chocolate	21	38,000	機械油(r=0.91) Mechanical oil(r=0.91)	20	250
牙膏 Tooth Paste	20.5	30,000	汽缸油(r=0.89) Cylinder oil(r=0.89)	50	200
漿糊 Paste	21.5	29,000	原油(r=0.855) Raw oil(r=0.855)	20	8
髮油 Pomade	21	15,000	食鹽水(20%) Salt water(20%)	20	1.5
糖蜜 Molasses	19	13,500	海水 Sea water	0	1.86
化妝面霜 Cosmetic Cream	20	12,000	海水 Sea water	20	1.1
沙拉 Salad	23	8,000	水 water	0	1.8
草莓醬 Strawberry Jam	23.5	6,000	水 water	20	1.0
塗料 Paint	19	4,500	水 water	100	0.28
蜂蜜 Honey	21	1,300	酒精 Alcohol	20	1.2
石油(r= 0.96) Petroleum(r=0.96)	20	2,000	苯 Benzene	20	0.6
石油(r=0.925) Petroleum(r=0.925)	20	20	汽油(r=0.717) Gasoline(r=0.717)	20	0.4
甘油 Glycerol	20	1,000	汽油(r=0.694) Gasoline(r=0.694)	20	0.3

當你詢價時，詳細提供以下資料：

- 液體名稱與用途。
- 比重、粘度、液溫。
- 揚量及吸入、吐出壓力。
- 所含固形物粒徑、混合比或含水率及液比的性狀。
- 運轉時間。

When inquiring, please give us the following information:

- Liquid name and usage purpose
- Specific ratio, viscosity, liquid temperature
- Capacity and suction/discharge pressure
- Diameter of solid particle, mixing ratio or water percentage included and characteristics of liquid.
- Time for operation

HNP 型 HNP type

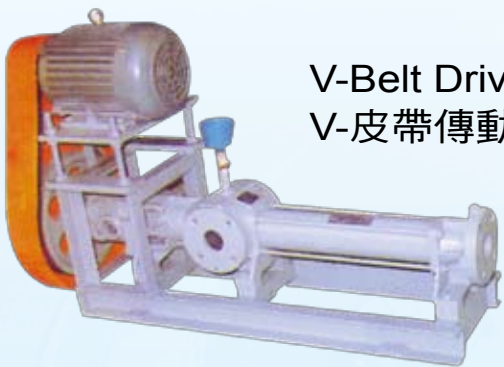
Direct Coupling
聯軸器直結傳動



▲ 養殖場之投餌用
Feed bait



▲ 養殖業魚漿輸送
Transport of fish jam



V-Belt Driving
V-皮帶傳動

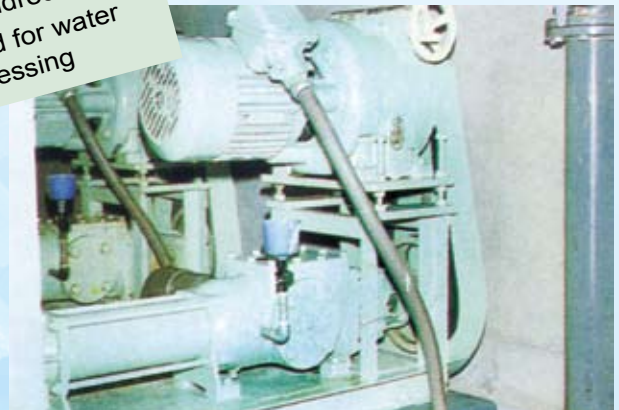


▲ 餘剩污泥抽吸Pump
Pump for dirty mud suction

• 水處理、污泥處理有3000
台以上的實績
• Over Three hundred units
have been sold for water
and mud processing



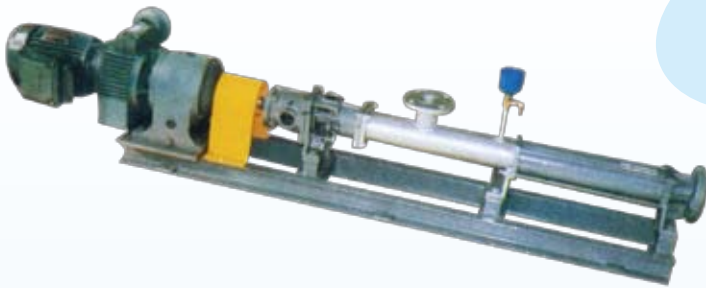
▲ 下水、生屎尿輸送Pump
Pump for underground Water and shit transport



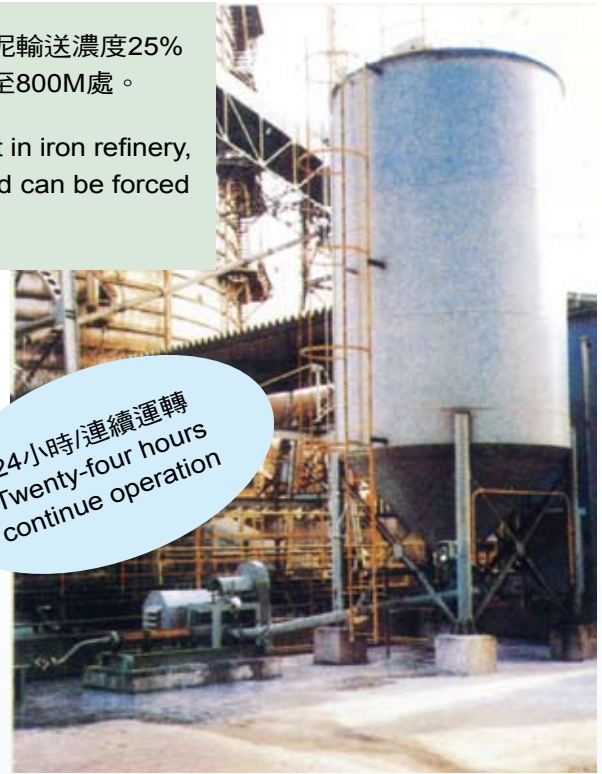
▲ 汙泥供給Pump
Pump for mud supply

- 煉鐵廠中之石灰污泥輸送濃度25%的污泥，可以壓送至800M處。
- Lime mud transport in iron refinery, liquid with 25% mud can be forced up to 800 meters.

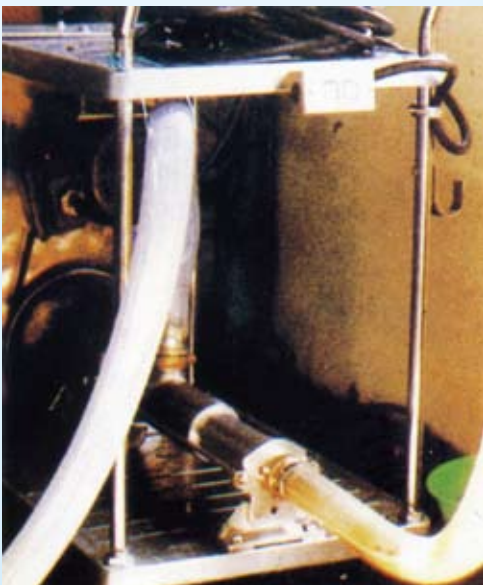
HNG 型 HNG type



24小時/連續運轉
Twenty-four hours
continue operation



HNC 型 HNC type



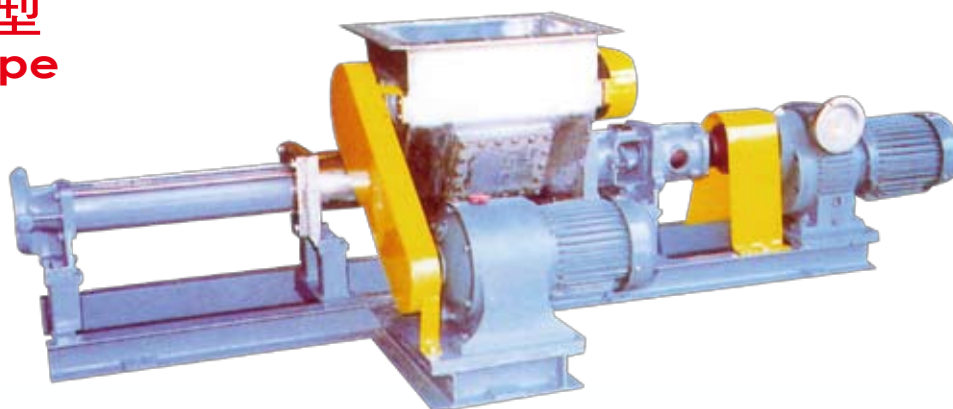
▲ 果汁之輸送
Juice transport



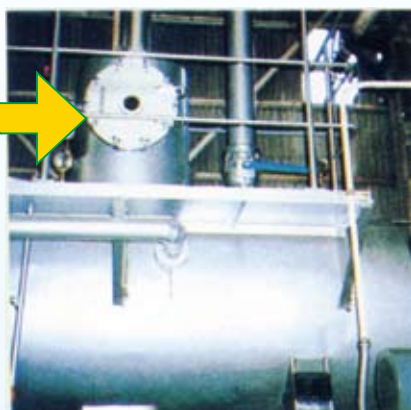
▲ 高粘度流體的輸送測試
Transport test of high viscosity liquid



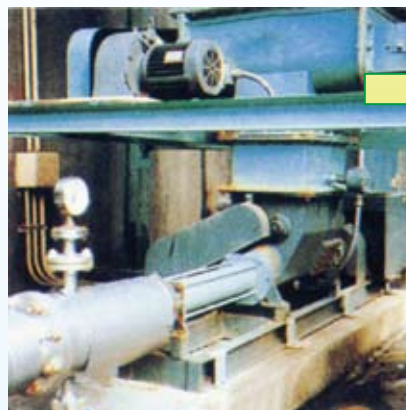
HNF-B 型 HNF-B type



從脫水機出來還含有水分90%之污泥直接輸送至乾燥機、焚化爐...之高壓輸送用。
Used for transporting the mud with 90% water from dehydrater to dryer, stove with high pressure.



▲ 在乾燥機裏定量輸入
Constant input for dryer



▲ 配合SCREW PUMP高壓輸送
Match the SCREW PUMP to transport by high pressure



▲ 垂直約5M送進乾燥機
Push into dryer over about 5 meters



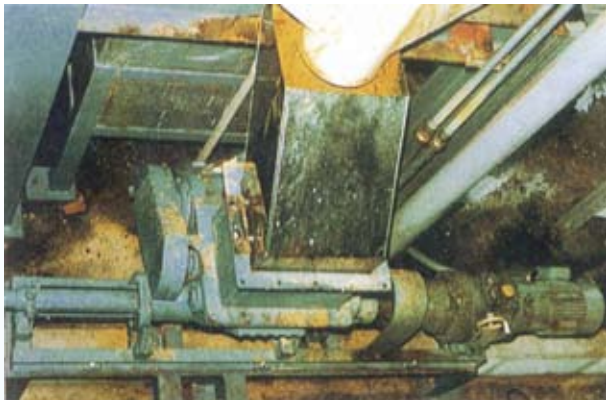
▲ 約40M水平輸送
Horizontal transport for about 40 meters.



▲ 從這裡垂直輸送
Transport vertically from here



HNF-A 型 HNF-A type



▲ 橘子渣之輸送
Transportation of orange dregs

▲ 豆腐渣之輸送
Transportation of bean curd dregs



◀ 高濃度原料之輸送
Transportation of high density material



◀ 適用於有脫水機而無空間之場合
Suit the place with dehydrater but lack of space

其他產品

魯氏鼓風機

魯氏真空泵

機械式真空助力泵浦

Other Products

Roots Blower

Roots Vacuum Pump

Mechanical Booster Vacuum Pump

ISO9001 認證通過



富資機械工業股份有限公司

FU-TSU MACHINERY CO., LTD.

公司工廠：臺灣省桃園縣龜山鄉南上村南上路345巷5號
電話：(03)3527766（代表號） 傳真：(03)3226176
網站：<http://www.fu-tsu.com.tw>
電子信箱：futsu.blower@msa.hinet.net

FACTORY : No.5 Lane 345, Nan Sung Road, Nan Sung Village, Kwei Shan Shiang,
Taoyuan, Taiwan, Republic Of China.
TEL : (03)3527766 FAX : (03)3226176
<http://www.fu-tsu.com.tw>
E-mail : futsu.blower@msa.hinet.net

經銷商 / Distributor