



永磁同步無齒輪曳引機

Gearless P.M.S.M Traction Machine



TAIWAN : HOITECH MACHINERY INDUSTRIAL CO., LTD

VIETNAM : QUANG LIEN CRANE ELEVATOR CO., LTD.



永磁同步無齒輪曳引機

無齒輪永磁同步曳引機由永磁同步電動機、曳引輪和制動系統組成，通過編碼器實現閉環控制，變頻調速運行。該曳引機相對傳統的產品來說，具有功率因數高、效率高、啟動電流小，啟動轉矩大、運行舒適平穩等優點；採用稀土永磁材料，體積小，重量輕；無齒輪減速，噪音低，可靠性高。

Gearless P.M.S.M Traction Machine

The PMSM Gearless traction machine is assembled by permanent-magnet synchronous motor, traction wheel and brake system through the encoder to achieve closed-loop control and frequency control operation. Compared with the traditional products, the traction machine has high efficiency factor, high efficiency, low starting current is small, large starting torque, smooth running comfort etc.; use of rare earth permanent magnet materials, small size, light weight; no gear, low noise and high reliability.

安全 Safety

舒適 Comfort

極佳低速型，確保乘客感覺更平穩、舒適；我們選擇了國際上最流行的PMSM磁場定向控制，以提高平層精度。

Excellent smooth speed machine ensures that passengers have more fluent and pleasant rides; we designed the most popular PMSM field-oriented control in the world to improve the flat layers accuracy.

環保 Environment Protection

電機的噪音小於等於 60dB；
剎車片採用無石棉的摩擦材料，各種工作狀況下性能穩定。

The motor noise is less or equal to 60dB; apply non-asbestos materials on brake lining, various working conditions and stable performance.

高效率 High Efficiency
體積小 Small Size
自然冷卻 Natural Cooling

結構說明

- 定子採用冷軋矽鋼片，F 級絕緣。
- 永磁體為釹鐵硼稀土永磁材料。
- 冷卻方式為自然冷卻。
- 曳引輪採用 QT-700 球墨鑄鐵材料。
- 制動系統採用電磁式制動器。
- Apply cold silicon steel stator with F class insulation.
- Apply rare earth element of NdFeB permanent magnetic as the materials of permanent magnet
- Apply a self-alignment roller bearings on driving.
- Cooling by natural cooling.
- Apply QT-700 nodular graphite cast iron material on traction wheel.
- Apply electric disk brake on braking system.

Structure Description

使用條件

按照 GB/T 13435-1992 "電梯曳引機" 標準要求，無齒輪永磁同步曳引機必須在下列工作環境條件下：

- 機房內的空氣溫度應保持在 5~40°C 之間。
- 環境相對濕度月平均值最高不大於 90%，同時該月月平均最低溫度不高於 25°C。
- 供電電壓波動與額定值偏差不得超過 ±7%。
- 環境空氣中不含有腐蝕性和易燃性氣體。
- 曳引鋼絲繩表面不得塗上潤滑劑和其他染物。
- 轆廂與對重裝置質量和鋼絲繩在曳引輪上的包角應滿足 GB 7588-2003 之規定。

Exploitation (make use of) Conditions

In accordance with GB / T 13435-1992 "elevator traction machine" standard, the gearless permanent magnet synchronous traction machine shall be working in the following environmental conditions:

- The indoor temperature between 5 ~ 40°C.
- The highest monthly average of environment relative humidity is less than 90%, while the monthly average minimum temperature is not higher than 25°C.
- No more than ± 7% on supply voltage fluctuations and rating deviation.
- No corrosive and flammable gases on ambient atmosphere.
- Traction rope shall be coated without any lubricants or any surface pollutants.
- The quality of cargo and counterweight and the angle of rope on the traction wheel shall comply with the regulation of GB / T 7588-2003 (Article 9.3.1b.)

噪音、振動

- 電機噪音 ≤ 60dB
- 振動速度有效值：
振動速度：1mm/s 以下
振動加速度：2m/s² 以下
滑輪扭振：4.5mm/s 以下
振幅：20 μm 以下

Noise Vibration

- Electrical Noise ≤ 60dB
- Vibration velocity RMS:
Vibration speed: 1mm / s and below
Vibration acceleration: 2m / s² and below
Pulley Torsion Vibration: 4.5mm / s and below
Amplitude: 15μm and below

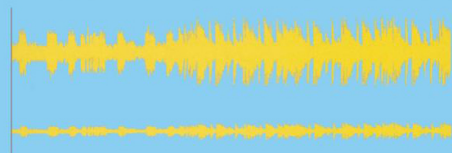
永磁同步無齒輪曳引機特性

■ 輕靜驅動力 節能清淨

噪音低、振動小、提高傳動效率 90% 以上，較傳統有齒輪主機平均節能 30% 以上。

■ Quiet Driving Force

Low noise, less vibration, improve above 90% driving efficiency, compare to traditional pinion traction machine can save average above 30%



傳統主機噪音
Traditional traction machine noise

無齒輪主機噪音
Gearless traction machine noise

■ 潔淨驅動力 經濟環保

採用永久密封之軸承，無須更換油脂，無油漬汙染，為客戶節省維護成本。

■ Clean driving force, economy and environment friendly

Using permanent sealed bearing, no require changing the lubricant, no grease pollute problem, saving your maintenance cost.

■ 精緻驅動力 節省空間

體積小巧，結構緊湊，充分滿足小機房電梯需要，節省更多有效空間。

■ Compact driving force, saving the space

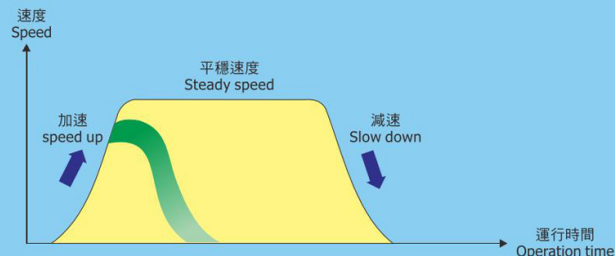
Compact design, density structure, be capable to use of small engine room, saving your space in the limited area.

■ 智能驅動力 平穩舒適

專用變頻器採用向量閉環控制技術，智能化的調速裝置能自動生成最佳速度曲線，使電梯在加速，減速，制動時更加憑穩，減少層間運行時間，乘坐更舒適。

■ Smart driving force, steady and comfy experience

With special vector closed loop control inverter, smart speed adjustment device can generate optimum speed curve, is more stability in accelerating, decelerating and braking, as well as reduce the operation time to floors, comfortable experience.

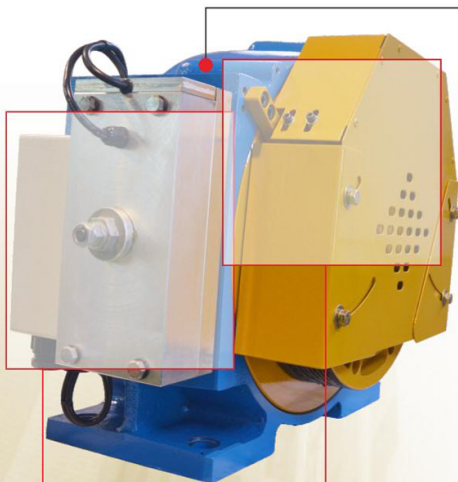


■ 對照表 Recommendation Form

曳引比 Suspension : 2 : 1	梯速 Elevator Speed			
載重量 Capacity	1.0	1.5	1.75	2.0
450	360 系列			
630		460 系列		
800				
1000	560 系列			
1150				

型號說明 Model Description

BB2	-	800	-	200
形式結構 Formal Structure		負載能力 Load Capacity		梯速 Elevator Speed
BB : Black Bear		450 : 450kg		100 : 1.0 m/s
1 : 外旋轉 External rotation		630 : 630kg		150 : 1.5 m/s
2 : 內旋轉 Interior rotation		800 : 800kg		175 : 1.75 m/s
		1000 : 1000kg		200 : 2.0 m/s
		1150 : 1150kg		



馬達框架

- 材質採用灰口鑄鐵(FC25)鑄造成型。
- 結構強度足夠、吸振性佳、變形量少，增加組配精度及耐用年限。

Motor Housing

- Apply Materials of gray cast iron (FC25) cast molding.
- The motor frame is sufficient strength structure, excellent vibration absorption, less deformation, enhances lifespan with precision and durability.



電磁式剎車器

- 作動次數可達百萬次以上。
- 低噪音，60dB以下。

Electromagnetic Brake

- Operation Frequency-1 million times and above.
- Low noise-60dB and below.

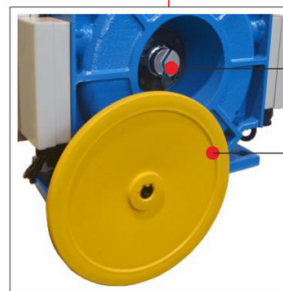


安全護蓋

- 防止繩輪運轉時，意外傷害發生之安全保護。

Safety Cover

- The security protection prevents that accident damage occurred during the wire rope operation.



編碼器

- 馬達心軸預設留有安裝編碼器界面連接套提供多樣種類選擇。

Encoder

- The encoder installation interfaces on the motor shaft in advance provide various options of traction machine.

安全盤車裝置

- 當主機斷電時，可藉由小齒輪與傳動輪之作用，將車廂安全，平穩停放在最近樓層。

Safety Handle Wheel

- The traction machine is operated through handle wheel drive pinions to drum gears while power off which could stop car cage smoothly on the nearest floor.

剎車手動釋放

- 當主機斷電時將剎車適當手動釋放，再配行小齒輪與傳動輪之作用，完成車廂停在最近樓層。

Brake Release

- The manual brake release appropriate releases the break through handle wheel drive pinions to drum gears while power off which could stop car cage smoothly on the nearest floor.

鋼索繩輪

- 材質採用球狀黑鉛鑄鐵(FCD650)鑄造成型，硬度值達HB230~260。

Wire Rope Wheel

- Apply materials spherical graphite cast iron (FCD650) on wheel with the hardness HB230~260.



360系列

結構：內轉式

曳引比：2:1

制動器電壓：DC110V

工作制：60% ED

絕緣等級：F 級

自重：240 kg

360 Series

Structure : Internal Rotation

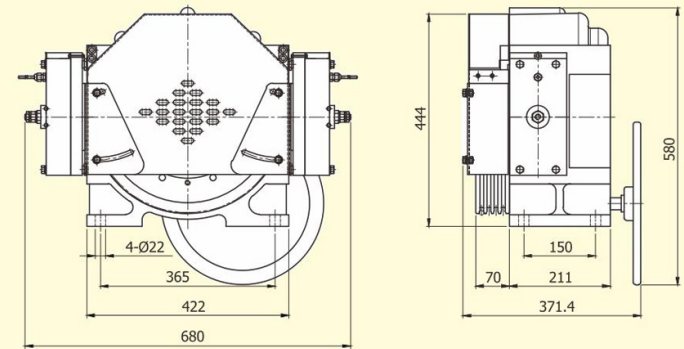
Suspension : 2:1

Brake voltage : DC110V

Operation ED : 60% ED

Insulation class : F class

Weight : 240 kg



電機規格及技術數據

型 號 Model	載重量 Capacity	梯 速 Elevator speed	推薦高度 High	額定功率 Rated power	額定電壓 Rated voltage
	(kg)	(m/s)	(m)	(kW)	(V)
BB2-450-100	450	1.0	50	3.2	220/380
BB2-450-150	450	1.5	80	4.8	220/380
BB2-630-100	630	1.0	50	4.5	220/380

額定電流 Rated current	額定轉矩 Rated torque	額定轉速 Rated RPM	額定頻率 Frequency load	主軸荷重 Shaft load	曳引輪直徑 Traction wheel diameter	繩 槽 Rope groove
(A)	(Nm)	(RPM)	(Hz)	(kg)	(mm)	(mm)
13.4/7.8	320	95	25.5	2000	400	3xø10x15
18.9/10.8	320	143	38.2	2000	400	3xø10x15
15.9/10.6	450	95	25.5	2000	400	4xø10x15



460系列

結構：內轉式

曳引比：2:1

制動器電壓：DC110V

工作制：60% ED

絕緣等級：F 級

自重：320 kg

460 Series

Structure : Internal Rotation

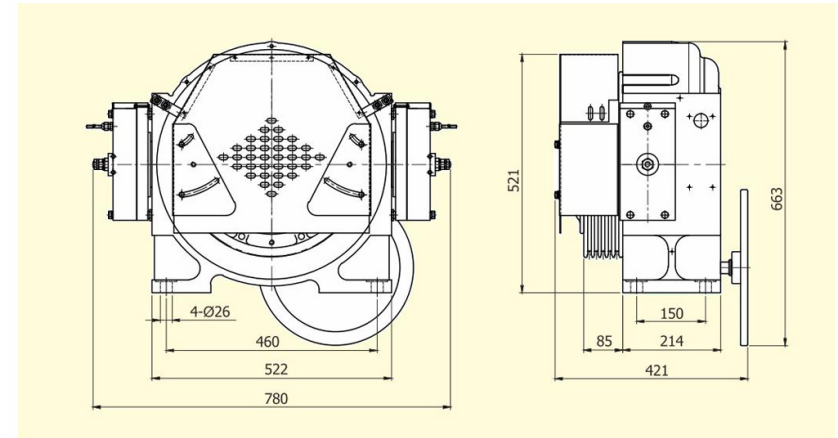
Suspension : 2:1

Brake voltage : DC110V

Operation ED : 60% ED

Insulation class : F class

Weight : 320 kg



機規格及技術數據

型 號 Model	載重量 Capacity	梯 速 Elevator speed	推薦高度 High	額定功率 Rated power	額定電壓 Rated voltage
	(kg)	(m/s)	(m)	(kW)	(V)
BB2-630-150	630	1.5	80	6.8	220/380
BB2-630-175	630	1.75	80	7.9	220/380
BB2-800-100	800	1.0	50	5.5	220/380
BB2-800-150	800	1.5	80	8.3	220/380
BB2-1000-100	1000	1.0	50	6.7	220/380

額定電流 Rated current	額定轉矩 Rated torque	額定轉速 Rated RPM	額定頻率 Frequency load	主軸荷重 Shaft load	曳引輪直徑 Traction wheel diameter	繩 槽 Rope groove
(A)	(Nm)	(RPM)	(Hz)	(kg)	(mm)	(mm)
26.0/14.4	450	143	38.2	3000	400	5xØ10x15
29.4/18.9	450	167	44.6	3000	400	5xØ10x15
21.3/11.9	550	95	25.5	3000	400	5xØ10x15
34.3/18.5	550	143	38.2	3000	400	5xØ10x15
29.4/16.7	670	95	25.5	3000	400	5xØ10x15

BB2 Gearless P.M.S.M Traction Machine

*P*ermanent *M*agnet *S*ynchronous *M*otor



560系列

結構：內轉式

曳引比：2:1

制動器電壓：DC110V

工作制：60% ED

絕緣等級：F級

自重：410 kg

560 Series

Structure : Internal Rotation

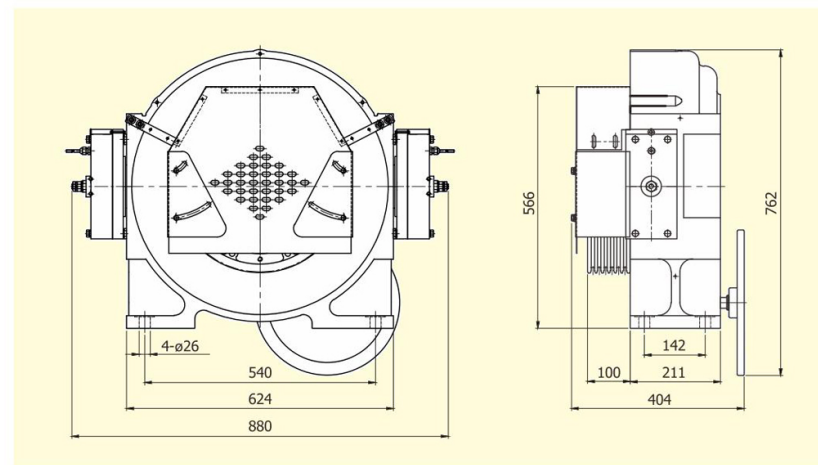
Suspension : 2:1

Brake voltage : DC110V

Operation ED : 60% ED

Insulation class : F class

Weight : 410 kg

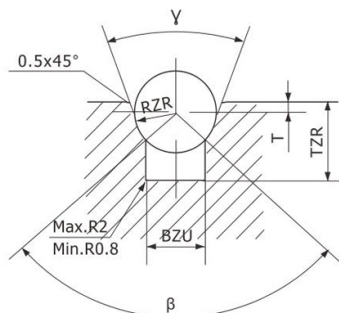


機規格及技術數據

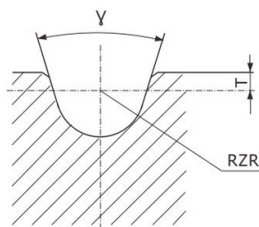
型 號 Model	載重量 Capacity	梯 速 Elevator speed	推薦高度 High	額定功率 Rated power	額定電壓 Rated voltage
	(kg)	(m/s)	(m)	(kW)	(V)
BB2-800-175	800	1.75	80	9.7	220/380
BB2-800-200	800	2.0	80	11.0	220/380
BB2-1000-150	1000	1.5	80	10.0	220/380
BB2-1000-175	1000	1.75	80	11.7	220/380
BB2-1000-200	1000	2.0	80	13.4	220/380
BB2-1150-100	1150	1.0	80	7.9	220/380
BB2-1150-150	1150	1.5	80	11.8	220/380
BB2-1150-175	1150	1.75	80	13.8	220/380
BB2-1150-200	1150	2.0	80	15.8	220/380

額定電流 Rated current	額定轉矩 Rated torque	額定轉速 Rated RPM	額定頻率 Frequency load	主軸荷重 Shaft load	曳引輪直徑 Traction wheel diameter	繩 槽 Rope groove
(A)	(Nm)	(RPM)	(Hz)	(kg)	(mm)	(mm)
36.0/20.8	550	167	44.6	3000	400	5xø10x15
38.9/20.8	550	190	50.9	3000	400	5xø10x15
38.3/23.8	670	143	38.2	3000	400	6xø10x15
42.7/27.1	670	167	44.6	3000	400	6xø10x15
45.2/25.7	670	190	50.9	3000	400	6xø10x15
29.7/15.8	670	112	30.0	3000	340	8xø8x12
46.0/23.4	670	169	44.9	3000	340	8xø8x12
53.0/24.5	670	197	52.4	3000	340	8xø8x12
58.2/27.7	670	225	59.9	3000	340	8xø8x12

單繞槽型
Groove of Single Wrap



複繞槽型
Groove of Double Wrap



槽 型 Groove	繩 徑 Rope	β 角	Υ 角	BZU	RZR	TZR	T
單 繞 Single Wrap	8	90	30	5.66	4	9.5	1.5
	9.3	90	35	6.56	4.65	12.5	1.5
	10	95	30	7.37	5	12.5	1.5
	11	95	30	8.11	5.5	12.5	1.5
	12	95	30	8.85	6	12.5	1.5
	13	96.5	30	9.70	6.5	12.5	1.5
	14	95	30	10.32	7	15	1.5
	16	96.5	30	11.93	8	15	1.5
複 繞 Double Wrap	10	-	35	-	5.2	-	2
	12	-	35	-	6.2	-	2

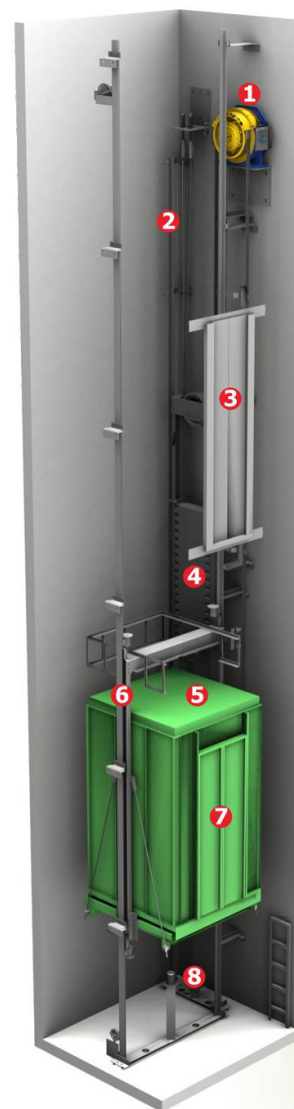
*樣本數據如有變動,恕不另行通知。

*推薦使用我司常規槽型,選用應按電梯實際參數計算曳引能力及鋼絲繩安全系數。

*Data are subject to change without prior notice.

*This is our factory standard configuration groove.

*The user should calculate the elevator traction capability and the safety factory of rope according to the actual parameter.



- | | |
|--------------------|----------------------------|
| ① 曳引機 | ① Traction Machine |
| ② 配重側導軌 | ② Counterweight Rail Guide |
| ③ 乘場門 (外側) | ③ Service Door (outside) |
| ④ 配重 | ④ Counterweight |
| ⑤ 車廂 | ⑤ Car Cage |
| ⑥ 車廂側導軌 | ⑥ Car Rail Guide |
| ⑦ 乘場門 (内側) | ⑦ Car Door (inside) |
| ⑧ 緩衝器
(車廂側及配重側) | ⑧ Buffer |

/ 安裝環境 /

■ 安裝方式	底腳座安裝型
■ 電源	變頻器輸入電壓
■ 最大額定力矩	200 %
■ 時間負載率	60 %
■ 絕緣等級	F 級
■ 位置	室內
■ 溫度	-10 ~ +40℃
■ 濕度	小於 90 %RH(不結霜)
■ 高度	低於1000m 以下
■ 編碼器	2048 / 8192 P/R(選配)
■ 制動器	雙電磁制動器
■ 曳引比	2 : 1

/ Traction Machine /

- Installation : Foot Mount Installation
- Power Supply : Input with inverter
- Maximum rated torque : 200%
- Operation ED : 60% ED
- Nsulation Class : F Class
- Location : Indoor
- Temperature : -10 ~ +40°C
- Humidity : 90% RH (no frost) and below.
- Height : No less than 1000m and below
- Encoder : 2048/8192 P/R (optional)
- Brake : Dual Electromagnetic Brake
- Suspension : 2 : 1

Professional cranes & hoists for lifting



Taiwan Black Bear Factory



QUANG LIEN Factory



TAIWAN : HOITECH MACHINERY INDUSTRIAL CO., LTD

ADD : No.126, Lane 332, Sec.8, HuanJhong Rd., Wu-Zih, Taichung, Taiwan, R.O.C
TEL : +886-4-2335 3333 FAX : +886-4-2335 3031
E-mail : hoitech2222@gmail.com



VIETNAM : QUANG LIEN CRANE ELEVATOR CO., LTD.

ADD : 299/15^A Ly Thuong Kiet, P.15 - Q.11 - TP.HCM
TEL : +84-8-3863 6666 FAX : +84-8-3864 7212
E-mail : quangliencrane@hcm.vnn.vn
WEB : www.quanglien.com

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