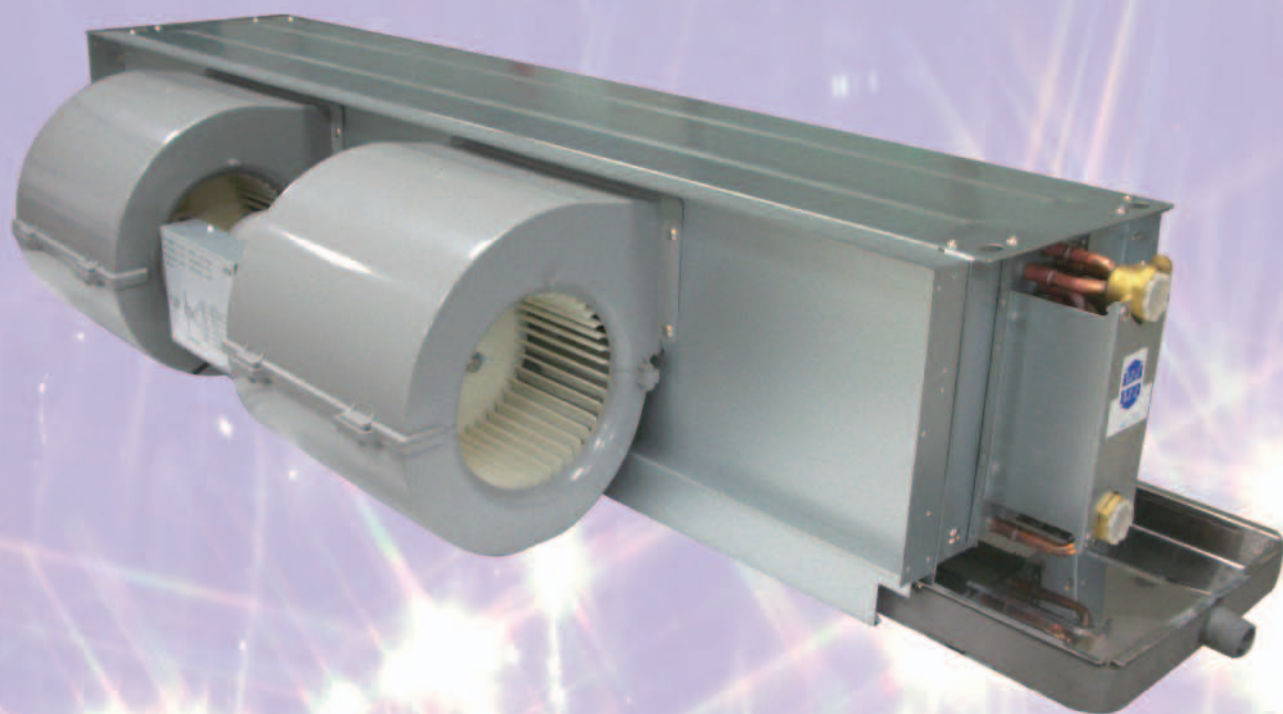


揚帆

YANGFAN

永磁 變頻式 室內送風機
同步
Inverter Type In-door Fan Coil Unit

採用三相全弦波極異永磁同步馬達
能為您節省 **40%** 以上電費



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變頻式室內送風機

特性：

- 採用三相全弦波極異永磁同步電機，可搭配傳統溫度控制器(含聯控)、或數位液晶顯示型溫度控制器組成變頻室內送風機，是一種全新高效率、低耗電的產品。

優點：

1. 隨意調節風量；

- 電機轉速調節範圍300-1300rpm。
- 可依需要風量，選擇三段式或無段變換電機轉速。
- 可在較寬的電壓範圍內使用，保持運轉平穩、安靜。

2. 多項保護功能；

- 突發的異常負荷保護。
- 超負載電流保護。
- 低負載堵住電流保護。

3. 提高效率，節省能源；

- 大幅提高運轉效率。
- 低負載運轉更能節省電費。

4. 低震動、低噪音；

- 採用正弦波SVPWM控制驅動方式，降低馬達運轉震動，無低頻電磁聲。

5. 智慧型控制；

- 液晶顯示型溫度控制器，能精確的控制室內溫度。
- 可隨意調節風量，以達到室內舒適溫度。
- 搭配控制水閥使用，讓主機運轉電費更節省。

6. 便捷更新；

- 原採用本公司之室內送風機，不必重新購買或拆除重裝，只要現場更換本機種使用之永磁式同步直流無刷馬達，搭配專用之控制器及溫度控制器，即可安心使用，節省工程費。

7. 低雜訊干擾、低電流諧波、低漏電壓電流。

- 解決變頻馬達對溫度控制之傳導與輻射干擾。
- 能與傳統三速溫度控制器結合。
- 能符合FCC、IEC61000-3-2與IEC61000-3-3。
- 較低電流THD，以避免對週邊之電子電機影響。

Inverter Type In-door Fan Coil Unit Characteristic:

- Adopting three-phase sine wave permanent magnet synchronous motor combined with traditional temperature controller (incl. parallel controller) or digital liquid crystal type temperature controller to assemble this inverter type in-door fan coil unit, It is a brand-new, high efficiency and low power-consumption product.

Advantages:

1. Adjust air volume at random:

- The motor revolution range adjustment is wide; from 300~1300rpm.
- According to the air volume desired, the three speed or CVT (Continuously Variable Transmission) of motor speed can be selected.
- When using in the broad voltage range, the motor always keeps the revolution being stable and calm.

2. Multiple protection capabilities:

- Suddenly abnormal loading protection.
- Overload current protection.
- Low load current block protection.

3. Improve efficiency, save energy.

- Significantly improve running efficiency.
- Low-load revolution saving more electricity expenses.

4. Low vibration, low noise.

- Adopt sine-wave SVPWM (Sinusoidal Pulse Width Modulation) control drive mode, low down the vibration of motor running, no low-frequency sound waves noise.

5. Intelligent control.

- LCD type temperature controller can control indoor temperature precisely.
- Adjust the air volume at random, keep indoor temperature being comfortable.
- Together with the usage of water control valve, making the power consumption expense more saving.

6. Convenient to update.

- Using the existing Yangfan Fan Coil Unit. No need to buy a new unit or dismantle the existing one, just change old motor into new PMSM (motor), mounted with specialized controller and temperature controller. You may rest assure to use the existing unit and saving engineering charge as well.

7. Electromagnetic Interference in low noise, Low current harmonics, ICCT.

- To solve the temperature control conduction and radiation interference problem of the inverter motor.
- To be able to connect with traditional 3-speed temperature controller.
- To be able to match with FCC, IEC61000-3-2 and IEC61000-3-3.
- Low current THD, to avoid any influence to the surrounding electronic and electric facilities.

標準規範

Standard Specifications

型號		單位	YVFCR							
MODEL		UNIT	400	600	800	1000	1200	1400	1600	
冷房能力	(H)	Cooling Capacity	Kcal/h	3,450	5,350	7,150	8,400	9,350	11,300	13,800
	(L)			2,420	3,750	4,920	5,810	7,100	8,380	10,230
暖房能力	(H)	Heating Capacity	Kcal/h	5,900	8,460	11,040	13,200	14,900	18,000	21,900
	(L)			3,310	5,030	6,390	8,010	9,590	11,180	13,600
風量	(H)	Air volume	m ³ /h	690	1,050	1,380	1,750	2,040	2,450	2,760
	(L)			341	533	669	862	1,033	1,212	1,365
機外靜壓		Ex. Static Pres.	mmAq	5						
風扇		Fan								
型式		Type 前曲葉片離心雙吸口式 Double inlet Centrifugal Forward-curved Fan								
數量		Number	pcs	1	2	2	3	4	4	4
馬達		Motor								
電源		Power source 1 PH - 220V -50Hz/ 60Hz								
型式		Type 永磁同步直流無刷變頻馬達 Permanent Magnet Synchronous DC Brushless VFD Motor								
輸入功率	(H)	Running Current	W	50	70	88	112	126	172	176
	(L)			29	38	50	60	71	95	100
運轉電流	(H)	Running Current	A	0.22	0.32	0.40	0.51	0.57	0.78	0.80
	(L)			0.13	0.17	0.22	0.27	0.32	0.43	0.45
數量		Number	pcs	1	1	1	2	2	2	2
盤管		Coil								
型式		Type 鋁質多縫鰭片，經機械脹管與紫銅管緊密結合 Slit aluminum Fins mechanically bonded to copper tubes								
操作壓力		Operating Pers.	Kg/cm ²	17.5						
水流量		Water Flow	l/min	11.5	17.8	23.8	28	31.2	37.6	50.1
水壓降		Head Loss	mAq	1.5	3.1	5.0	2.6	3.1	3.9	5.2

附註：以上能量在下列室內狀況下求得：

冷房：進風乾球溫度 27°C，濕球溫度 19.5°C

冰水進水溫度 7°C，出水溫度升高 5°C

暖房：進風乾球溫度 21°C，熱水進水溫度 60°C

Note : the capacity is based on the following conditions

Cooling—Entering air temp. 27°C DB, 19.5°C WB. Entering

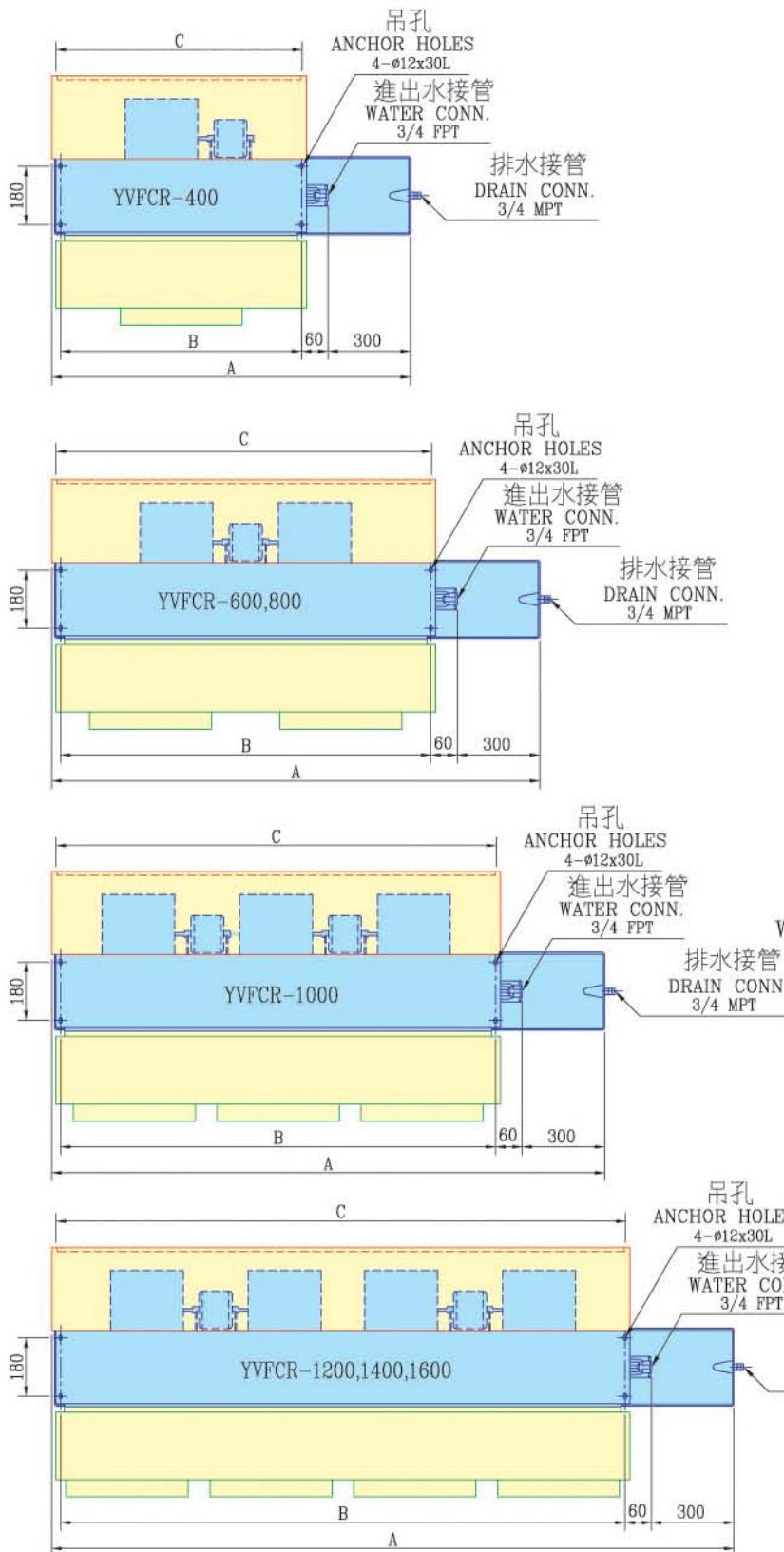
chilled water temp 7°C leaving temp rise 5°C

Heating—Entering air temp 21°C DB. Entering hot water

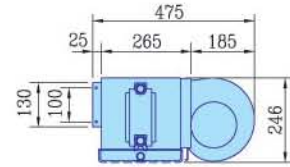
temp 60°C

變頻吊掛隱藏式室內送風機外型尺寸

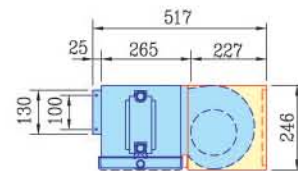
VFD FAN COIL UNITS (Ceiling Concealed Type) Dimension



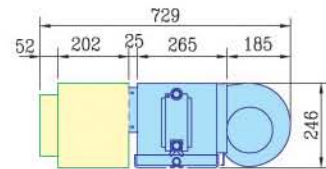
一般型側面尺寸
SIDE DIMENSION



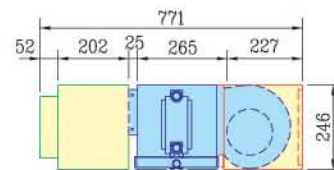
附回風箱側面尺寸
With Return-Air Box



附集風箱側面尺寸
With Plenum Box



附集風箱+回風箱側面尺寸
With Plenum & Return-Air Box

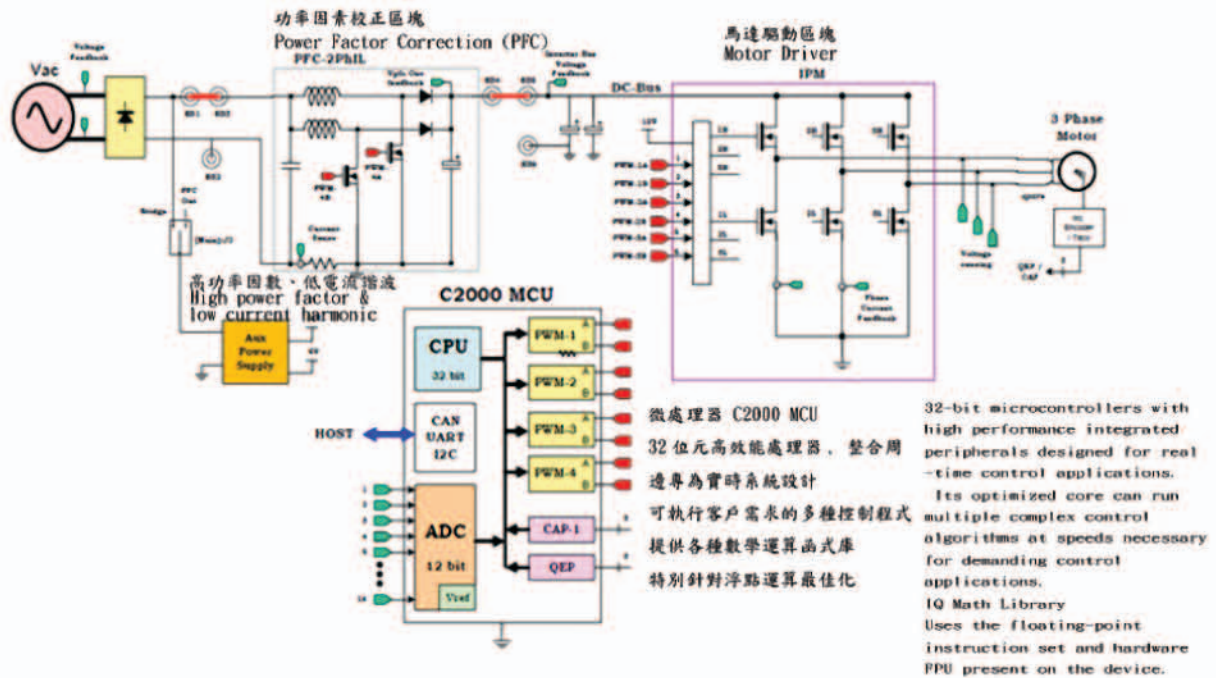


註：1. 紅色為附回風箱
2. 綠色為附集風箱

Note : 1. RED : With Return-Air Box
2. GREEN : With Plenum Box

MODEL	A	B	C
YVFCR-400	1090	710	670
YVFCR-600	1290	910	870
YVFCR-800	1520	1140	1100
YVFCR-1000	1740	1360	1320
YVFCR-1200	1950	1570	1530
YVFCR-1400	2140	1760	1720
YVFCR-1600	2140	1760	1720

高壓電機驅動結合功率因素校正示意圖 High Voltage DMC + PFC Board Diagram



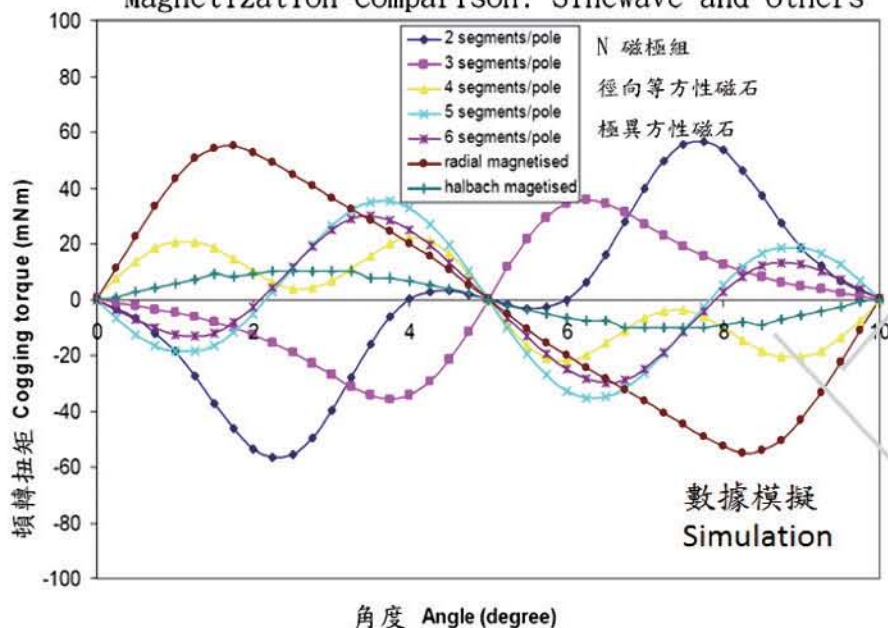
三相全弦波永磁無感測無刷同步馬達優勢 3-Phases Sinewave-Output Sensor-less Brushless PMSM (ECM) Advantages

特點 Features	三相全弦波永磁無感測無刷同步馬達 3-Phases Sinewave-Output Sensor-less Brushless PMSM	單(三)相方波永磁直流感測無刷馬達 Square-wave Permanent Magnet BLDC Motor	交流感應馬達 PSC Motors	有刷直流馬達 Brush DC Motors
電源供應 Power supply	交流或直流 AC or DC	直流 DC	交流 AC	直流 DC
體積小, 重量輕 Compact Size, Light Weight	◎	◎	X	△
轉子慣性低 高速度運轉性能 Low Rotor Inertia, High Speed Rotation	◎	△	△	X
低頓轉, 柔啟動 Low Cogging, Soft Start	◎	△	X	X
無轉子銅損 No Rotor Copper Lose	◎	◎	X	△
效率 High Efficiency	◎	△	X	△
溫升 Heat Dissipation	◎	△	△	X
低諧波 Voltage/ Current Harmonic	◎	X	◎	X
低干擾 Low Noise	◎	X	◎	X
無碳刷摩擦無火花 No Carbon & Electric Flash	◎	◎	◎	X
低速扭力 Low Speed Torque	◎	◎	X	△
無整流子 No Brush maintenance	◎	◎	◎	X
過載能力 Over Load Capability	◎	◎	X	△

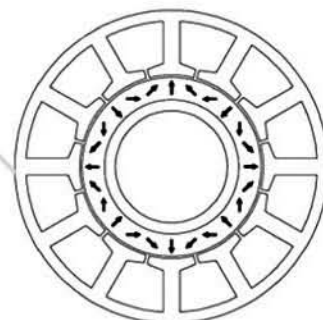
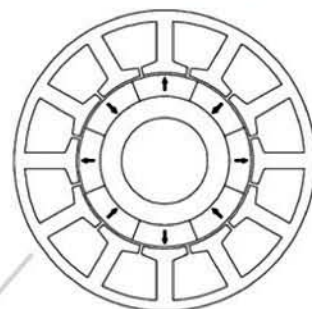
◎ : 佳(Good) △ : 尚可(Acceptable) X : 差(Bad)

弦波與非弦波充磁比較

Magnetization comparison: Sinewave and others



徑向等方性永磁
Radial Isotropic Magnet



極異方性永磁

Hard Ferrite Polar Anisotropic Magnet

低頓轉、低震動

Low cogging torque & low vibration

三相全弦波極異永磁同步馬達

3-Phases Sinewave-Output Sensor-less Brushless Permanent Magnet Synchronous Motor

弦波 Sinewave

脈寬調變控制

驅動功率開關元件

無電樞(無刷)驅動

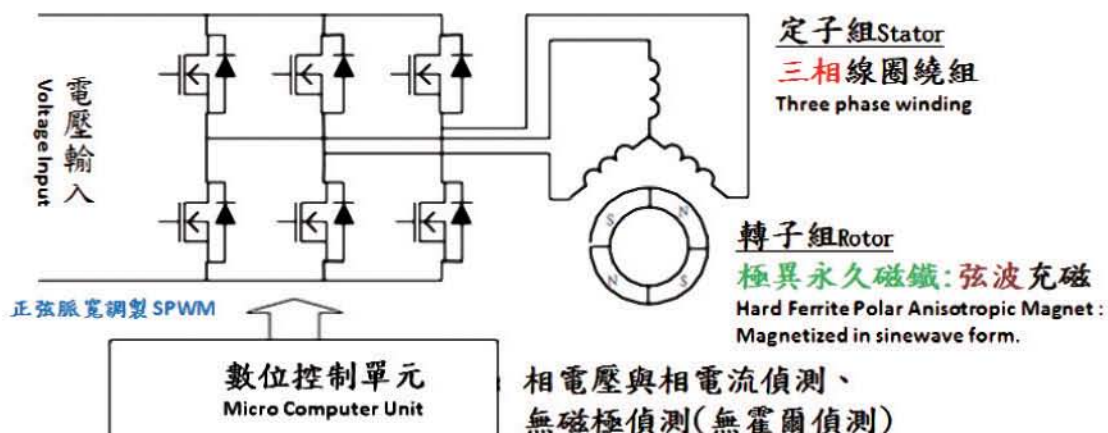
Driven by power switches that is controlled through PWM.

線圈反電動勢波形為弦波(近似)

Waveform of Back-EMF is close to sinewave.

線圈電流波形也為弦波(近似)

Waveform of current is close to sinewave, too.



相電壓與相電流偵測、
無磁極偵測(無霍爾偵測)
To detect voltage & current by using
sensor-less technology instead of Hall
sensor.

同步驅動 Synchronous drive