

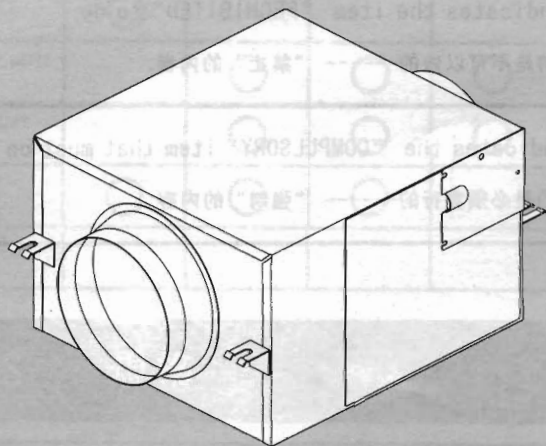
## Cabinet Fan 送風機

### INSTALLATION AND OPERATING INSTRUCTIONS

### 安裝使用說明書

#### Model 型號

FV-12NS3	FV-20NS3	FV-12NS3H	FV-20NS3H
FV-15NS3	FV-23NL3	FV-15NS3H	FV-23NL3H
FV-18NS3	FV-25NS3	FV-18NS3H	FV-25NS3H
FV-18NF3	FV-25NF3	FV-18NF3H	FV-25NF3H



Thank you very much for choosing Panasonic cabinet fan.

Please read the instructions carefully before attempting to install, operate or service the cabinet fan.

Failure to comply with instructions could result in personal injury and / or property damage.

Please retain this booklet for future reference.

感謝您選用 Panasonic 送風機。

安裝使用和維護本送風機前，請仔細閱讀本使用說明書。

不遵照此說明書進行操作有可能導致人員受傷和/或財產損失。

請妥善保管好此說明書以備日後參考。

# WARNING AND CAUTION

# 警告及注意事項

To avoid any injury or damage, please follow the rules as mentioned below.

爲了防止危害或損傷到使用人和他人的人身與財產安全，對務必遵守的事項作如下說明。

- Any damage would happen due to NOT following the rules or mis-use, the levels of damage are categorized and explained as indicated below.

沒有遵守指示或錯誤地使用時，所引起的危害或損傷的程度，用下列符號進行分類、說明。



## WARNING 警告

Those things shown in this column indicate that there is possibility of causing death or severe injury.

有此標記的欄目，是有導致死亡或重傷可能的內容。



## CAUTION 注意

Those things shown in this column indicate that there is possibility of causing injury to the users or damage.

有此標記的欄目，是有可能導致受傷或產生物質損壞的內容。

- Those rules which are expected to be followed are illustrated and explained by the below diagrams.

對希望遵守的內容和種類，用下列符號進行分類、說明：



This symbol indicates the item "PROVOKING ATTENTIONS".

這樣的符號，指的是敬請當心-----“提示注意”的內容。



This symbol indicates the item "PROHIBITED" to do.

這樣的符號，指的是不可以做的-----“禁止”的內容。



This symbol indicates the "COMPULSORY" item that must be followed without failure.

這樣的符號，指的是必須實行的-----“強制”的內容。

Panasonic Corporation

- Reconstruction of the internal wiring is prohibited.

禁止改動內部接線。



May cause unexpected accident.

可能會產生不能預測的事故。

- Any obstacle should not be placed near the inlet and outlet openings.

在出風口、進風口附近，禁止放置障礙物。



May cause injury by hitting or sucking of obstacle.

障礙物被吹起，吸進機體裏，可能會引起受傷。

- When gas leakage occurs, open the window and door to make air circulate, neither turn on nor turn off the product.

當發生煤氣洩漏時，請打開門窗使室內空氣流通，禁止開啓或關閉本產品。



May cause explosion.

可能會發生電火花引起爆炸。

- Any power source other than the rated voltage and frequency can not be used.

請勿使用額定電壓及頻率以外的電源。



May cause fire or damage the unit.

可能會引起火災或損壞本產品。

- Neither unauthorized inspection, modification, repair nor disassembly are allowed.

禁止擅自檢查、改造、修理、拆分。



May cause unexpected accident.

可能會產生不能預測的事故。

- Eyes should not be faced to the outlet opening (specially when the fan starts up).

請勿把眼睛對着出風口(特別是在起動時)。



Any flying substance may get into the eyes.

垃圾等會飛出來，可能會弄進眼睛裏。

- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

本產品不適合有殘障、智障或精神障礙的人士，或缺乏經驗、常識者(包括兒童)維護使用，除非在監護人的看護或指導下使用。

應確保兒童不要把本產品當作玩具玩。

- All installation and maintenance shall be done by qualified persons.

所有安裝和保養應由專業服務人員完成。



Unqualified construction may cause unexpected accidents.

安裝工程有不完善之處，可能出現不能預測的事故。

- Disconnect power supply before inspection.

檢查前，必須切斷電源。



May cause injury or electric shocks.

可能會引起受傷或觸電。

- Immediately stop the operation in case of any abnormality (noise, vibration, smell), and request for repair.

發生異常(聲音、振動、臭味)時應立即停止使用，進行修理。



May cause unexpected accident.

可能會產生不能預測的事故。

- The protective tools, gloves or helmet, should be worn while inspection or maintenance.

在檢查或維護時，請使用手套、安全帽等保護工具。



May cause person injury.

可能會引起受傷。

- The fan may rotate caused by the wind inside the duct, even power supply is switched off. Please make sure the fan has stopped actually before inspection.

即使關掉電源，因為導風管內還有風，送風機還會運轉，請確認扇葉完全停止後再進行檢查。



May cause injury if being caught into the rotating section.

人和物等被捲進運轉部分，可能會引起受傷。

- Be careful not to drop the inspection panel or parts removed from the unit when inspection.

檢查時，要防止檢查板或其它零部件從機體上掉落。



May cause person injury.

可能會引起受傷。

- Secured upon the strengthened foundations for installation.

安裝本產品的建築結構必須牢固。



Improper installation may cause accident because of the falling of the product.

建築結構不牢固可能會導致產品墜落而引發意外。

- Beware of C. G. and weight when moving.

移動時，要注意重心及重量。



Hang only as the unit is normally assembled, or else it may drop and cause injury.

在機體完好的情況下，才能往上吊，否則可能會引起脫落、受傷。

- Weight of duct should not load on the unit.

導風管等的負荷重量不可落在機體上。



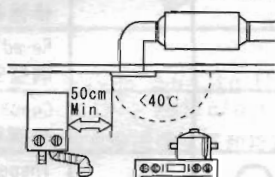
May cause injury due to malfunctions or dropping.

可能產生故障或脫落，引起受傷。

- Avoid a location with high temperatures.

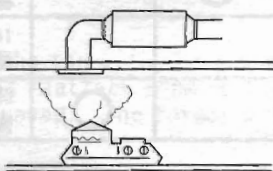
( Trouble may be caused and the motor life may be shortened. )

禁止安裝在高溫場所。(會引起故障及縮短馬達壽命)



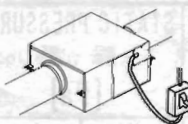
- Avoid a location with too much oil fume.

禁止安裝在油煙過多的場所。



- Install a fan protection device like a motor overload breaker in the wiring.

在綫路中安裝一個過載保護裝置。



- Specified number and size of the bolts should be used for hanging the unit and they must be tightened.

在天花板口懸掛機體時，螺栓要使用規定的數量和直徑，且必須擰緊。



May cause injury due to insufficient strength.

螺栓不合格或未擰緊，可能會因產品墜下而造成人員受傷。

- Electrical installations should be done according to the wiring diagram and local electrical wiring rules of fixed wiring.

電氣工程方面，必須按照電氣原理圖及當地的接綫規程進行施工。



Unqualified wiring may cause electric shock or fire.

接綫不合格可能會引起漏電或火災。

- Grounding should be connected.

必須有接地裝置。



May cause electric shocks.

當出現故障或漏電時，可能會觸電。

- Precautions must be taken to avoid the back-flow of gases into the room from the open flue of gas or other fuel-burning appliances.

防止氣體或燃料燃燒器具產生的氣體回流進入房間中。

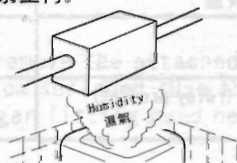


May cause back-flow of gases.

可能引起煙氣逆流。

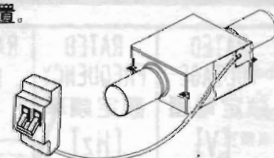
- Do not install the fan where the humidity is high (85% or higher) such as near a swimming pool, public hot spring bathing area or outdoors.

禁止安裝在高濕度的場所(85%以上)，例如泳池、溫泉室內。



- There should be an all poles switch with minimum 3mm contact gap in the fixed wiring.

安裝時，需在供電綫路中安裝其觸點開距不少於3mm的全極斷開裝置。



- Connect the duct avoiding the following cases.

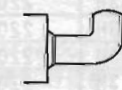
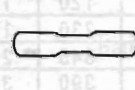
安裝導風管時應禁止以下情況發生。

(1) Sharp bending angle.  
極端彎曲

(2) Bended more than once.  
多次彎曲。

(3) Reduced diameter at the connection.  
接續導風管內徑變小。

(4) Bending near the discharge port or suction port.  
在出氣口和吸氣口旁，急速彎曲。





# INSTALLATION INSTRUCTIONS

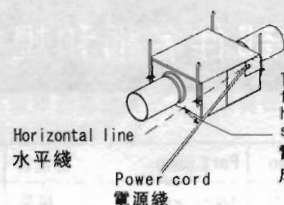
# 安裝說明

During installation or maintenance, the power cord should be lower than the outlet of terminal box.

安裝及維護時，電源線的位置應低於接線盒的出口。



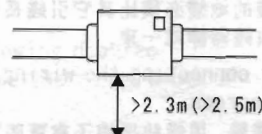
May cause water flow along the power cord into wiring box or scrape the power cord.  
可能導致水沿電源線流入接線盒或刮傷電源線。



The angle between the power cord and horizontal line should be at  $5^{\circ} \sim 30^{\circ}$ .  
電源線與水平方向成  $5^{\circ} \sim 30^{\circ}$  角。

The installation height of Cabinet Fan shall be more than 2.3m (2.5m for Malaysia market) above the floor.

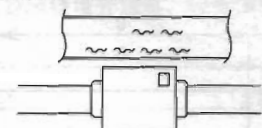
送風機的安裝高度，距地面必須大於2.3m(馬來西亞市場須大於2.5m)。



Prevent accident 防止意外

The motor and frame should not touch any object.

馬達及框架不要接觸任何物體。



May cause vibration and noise 會產生振動及噪音

## Caution:

1. This product is not provided with power cord. When connect or change the power cord, Please use 60227 IEC 53 (RVV) (3X0.75mm<sup>2</sup>) cord.
2. When ventilating a room that use combustion equipment with a chimney, provide a suction port large enough. The size of the suction port should be decided by the instruction of the combustion equipment. (Exhaust gas may reverse into the room, which may cause carbon monoxide poisoning.)
3. For an exhaust duct to outdoor, attach a pipe hood to the end and keep at least a 1/100 slant downward. (To prevent rain or frozen water entering.)
4. Heat insulation should be taken if there is dewfall outside of the adapter and frame when indoor heating in winter.

## 注意：

1. 本產品不提供電源線，在連接或更換電源線時，請使用已通過認證的3蕊60227 IEC 53(RVV)號線且導線面積為0.75mm<sup>2</sup>。
2. 在使用氣體燃具的房間裏換氣時，需另外設置一個足夠大的進氣口，進氣口的大小請根據氣體燃具使用說明書的要求來設置。(煤氣在室內逆流，可能會引起一氧化碳中毒。)
3. 通往室外的管道必須保持至少1/100的向下傾斜。(防止雨水或結冰水倒流進入送風機殼體內。)
4. 在冬季，在向室內供暖氣時，在接頭和機體的外表面有可能結露，必須進行隔熱處理。

# INSTALLATION INSTRUCTIONS

# 安裝說明

## 1. Before installation 安裝前

Check the following. 請確認以下內容。

- Is there any breakage or deformation?  
有沒有破損變形?



## Notes:

- Check the power source of the product before installation.
- To avoid insect intrusion, please purchase a separately sold insect filter unit from the market. (The filter unit should be bought by customer and must be cleaned periodically to prevent clogging with dirt and dust. Furthermore, the filter will make pressure losing and it may reduce the air volume.)

## 注意：

- 確認產品的電源後進行安裝。
- 為防蟲子爬進殼體裏面，請另外購買市場上防蟲過濾網裝置。(使用過程中，要定期清洗，切勿讓灰塵把過濾網的孔眼堵塞了。另外，安裝過濾網會造成壓力損失，可能導致風量下降。)

## 2. Installation method 安裝方法

To hang the fan, be sure to attach firmly with hanger bolts, washers and nuts. (Which should be M8-M10 and be supplied by the customer).

將安裝吊杆、墊圈、螺母(客戶另購,必須使用M8-M10的規格)牢固的安裝好。

Vibration cushion rubber set (supplied by the customer) can be used if in special condition for vibration requirement and it must can support the weight of the product.

如需要在特別防止振動的條件下,請使用防震橡膠(客戶另購),其強度必須能夠承載本產品。

Install the main body horizontally.  
機體要水平安裝。

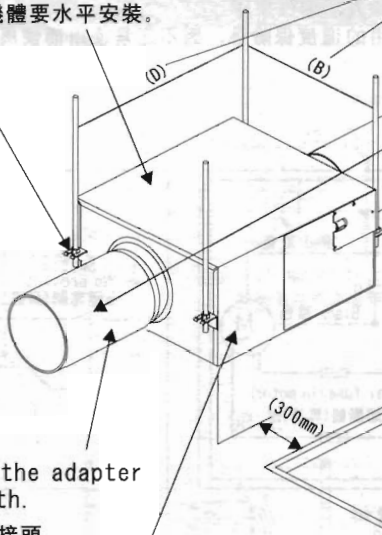
The structure of the ceiling and the suspending set for hanging the product must support more than 5 times weight of the product.

天花板結構和用於懸掛本產品的懸掛組件必須能夠承載大於本產品重量5倍的強度。

※ Please see page 8 for the value of B & D.  
請在第8頁查看B和D的值。



Air flow  
風向



Install the exterior duct with a slightly declining slope toward outer side ( $\frac{1}{100} \sim \frac{1}{50}$ ).

通往屋外的導風管必須保持輕微向下傾斜( $\frac{1}{100} \sim \frac{1}{50}$ )。

Be sure to provide an square inspection window of 45 cm or more.  
必須設置一個45cm以上的方形檢查口。

Connect the circular duct to the adapter using noncombustible sailcloth.

請使用不可燃的帆布來連接導風管和接頭。

Heat insulation should be taken if there is dewfall outside of the duct and frame.

在機體和導風管的外表面有可能結露,必須進行隔熱處理。

### Notes:

- To install the fan with the inspection panel facing down, remove the attached four hanger fittings and reattach them in the holes on the top and bottom surfaces (Use the screws you just removed). The former holes for installing the hanger fitting need be sealed.

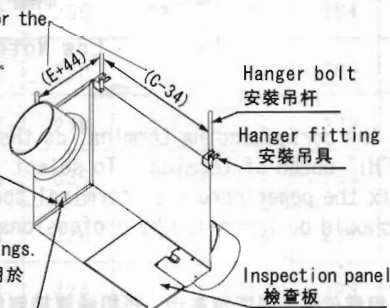
### 注意:

- 若檢查板向下安裝,安裝前請把4個安裝吊具取下,對好頂面和底面的孔后用取下的螺釘再進行安裝。原先用於安裝的孔需要進行密封處理。

※ Please see page 8 for the value of C & E.  
請在第8頁查看C和E的值。

Aluminum tape (supplied by the customer)  
鋁箔膠帶(顧客另購)

The former holes for hanger fitting should be sealed by aluminum tape or similar things.  
用鋁箔膠帶或類似物品將原來用於固定安裝吊具的孔密封。



Concave holes  
凹孔

Fixed with three screws by electric screw driver.

用電動螺絲刀固定三個螺釘。



Hanger fitting positions for installing with the inspection panel facing down.  
檢查板向下安裝時安裝吊具的位置。

Hanger fitting screw positions.  
安裝吊具固定螺釘的位置。

## 3. Wiring Connecting 引綫連接

### ■ Subcontract an electrician for wiring.

Work in accordance with the Electrical Equipment Engineering Standard and the domestic wiring rule specified by the power company.

Carry out grounding work.

Open the terminal cover and connect wires according to the following diagram.

Protective thermostat fuses are installed inside the motor. Once the fuses break after excessive temperature rise due to abnormal usage, the motor will not turn.

### ■ 委託專門的電氣工程店。

接綫工程是根據電氣設備技術基準和內部接綫規程，進行安全牢固地安裝。

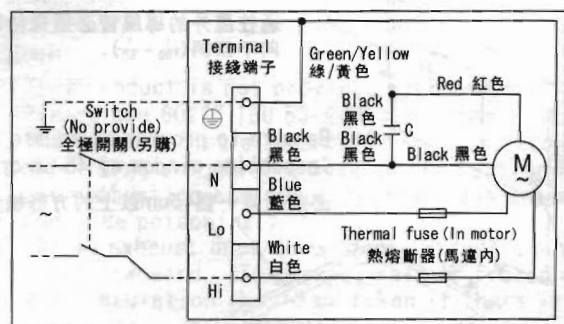
必須實施接地工程。

打開端子盒蓋連接。請根據下圖的接綫方法進行連接。

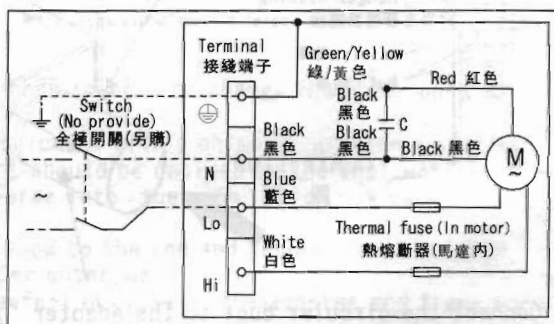
在本產品馬達裏面，安裝有保護馬達用的溫度保險絲，因不正常使用而使馬達繞綫溫升過高，一旦溫度保險絲斷開，馬達則起動不了。

### ■ Wiring diagram

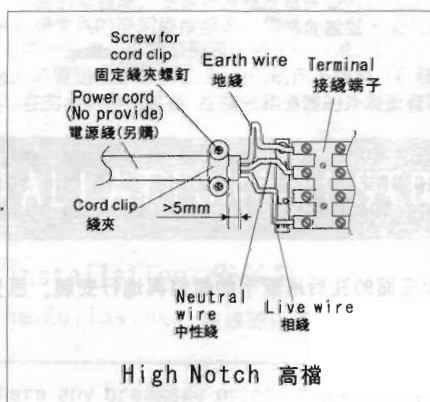
接綫示意圖



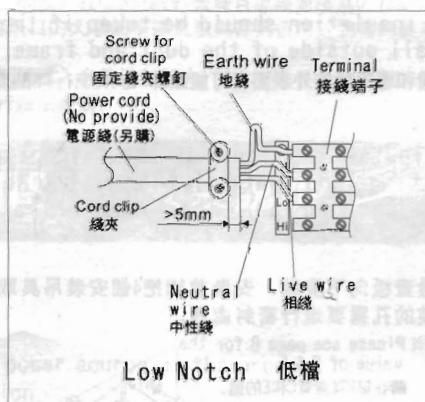
High Notch 高檔



Low Notch 低檔



High Notch 高檔



Low Notch 低檔

- Connect the neutral wire and earth wire to the corresponding terminal as the above figure. To select high speed, connect the phase line to the "Hi" notch of terminal; To select low speed, connect the phase line to the "Lo" notch of terminal. Then fix the power cord with terminal screws and tight the power cord with cord clip. (to avoid danger, it should be installed by professionals and be sure to connect the earth wire)

根據上面的接綫圖將中性綫及地綫連接到端子的相應位置。如選擇高速，將相綫連接到端子相應的"Hi"檔；如選擇低速，將相綫連接到端子相應的"Lo"檔；最后將電源綫用綫夾固定。（為避免危險，必須由專業人員進行安裝，并務必接上地綫。）



# INSTALLATION INSTRUCTIONS

# 安裝說明

## 3. Wiring Connecting 引綫連接

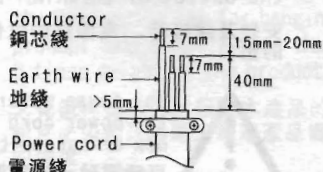
■ The earth wire of the power cord must be longer than other wires for 15-20mm, and each wire inserted to the terminal need wiring to sheaves.

電源綫的地綫必須比其它引綫長15-20mm, 且插入端子中的每股絞綫需擰成一束。

■ After connecting the wiring, install the terminal cover with screws.

接好綫后, 用螺絲把端子盒蓋固定好。

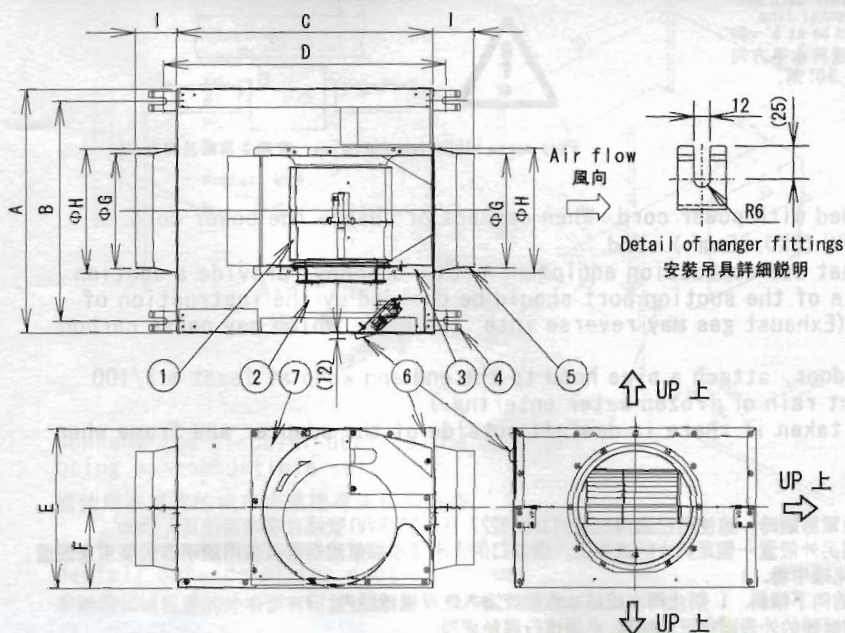
Wring each wire to sheaves  
將每股絞綫擰成一束



60227 IEC 53 (RVV) (3X0.75mm<sup>2</sup>)

## NAME AND DIMENSION OF COMPONENTS

## 部件名稱和規格



No.	Part name	部品名	Q'ty
1	Impeller	扇葉	1
2	Motor	馬達	1
3	Fan casing	送風機殼體	1
4	Hanger fitting	安裝吊具	4
5	Adapter	接頭	2
6	Terminal cover	端子盒蓋	1
7	Inspection panel	檢查板	1

↑ UP 上  
The figure indicates the surfaces in the left view which can be installed upwards.  
此圖示表明在左視圖中可以朝上安裝的產品側面。



Other installation directions are prohibited except the directions indicated in the figure.

禁止使用圖示以外的安裝方向進行安裝。

Unit 單位: mm

MODEL 型號	A	B	C	D	E	F	G	H	I	CONNECTER DUCT DIMENSION 管道尺寸
FV-12NS3 FV-12NS3H	290	250	291	335	184	92	97	112	51	Φ100
FV-15NS3 FV-15NS3H	290	250	302	346	206	103	145	163	60	Φ150
FV-18NS3 FV-18NS3H	316	276	338	382	232	116	145	163	60	Φ150
FV-18NF3 FV-18NF3H	376	336	397	441	254	127	195	211	70	Φ200
FV-20NS3 FV-20NS3H	416	376	441	485	272	136	195	211	70	Φ200
FV-23NL3 FV-23NL3H	468	424	469	513	298	149	195	211	70	Φ200
FV-25NS3 FV-25NS3H	494	450	505	549	334	167	240	255	85	Φ250
FV-25NF3 FV-25NF3H	494	450	505	549	334	167	240	255	85	Φ250



# MAINTENANCE AND INSPECTION

# 維修保養

All maintenance, inspection, parts replacement and repair shall be done by service man.

所有保養、檢查、部件的更換及維修都應由專業服務人員完成。

## Inspection and maintenance 檢查維護

For long-term and safe use of the fan, inspection and cleaning of the fan approximately once a year is required. Maintenance and inspection by a specialized subcontractor is required for prevention of accidents due to damaged parts deriving from aging and for normal performance.

部件的自然損耗可能會引起災害或性能變化，為了保證送風機的長期安全使用，必須由有資格的专业人士進行至少一年一次的檢查和維護。

Please pay attention that don't pull the wiring during service, maintenance and cleaning.

請注意在產品的服務，維修及清潔過程中不要拉動電氣引綫。

# TROUBLE SHOOTING GUIDE

# 故障處理

## Trouble shooting 故障判斷

Check according to the following table and correct the problem. If the fan still does not work, disconnect the power source and contact the dealer.

根據下表中的指示，若有異常現象出現，必須切斷電源，與代理商聯系。

PROBLEM 問題	CAUSE 異常	Insufficient air flow 風量不足	Excessive noise 噪音過大	Excessive vibration 振動過大	Overheated motor 馬達過熱	Run abnormally 運轉異常	Action 對策
Poor foundation 安裝基礎弱			○	○			Reinforce foundation 修補基礎
Faulty installation 安裝不良			○	○			Re-adjust installation 調整安裝
Low voltage 電壓下降		○					Check power source 確認電源
Contact between rotary and stationary parts 動體與靜體相接觸			○	○	○		Inspect and adjust 檢查、調整
Sucked in objects / Adhered dust 混入異物，帶有灰塵			○	○	○		Inspect and clean 檢查、清潔
Faulty ducting 導風管不良		○	○	○			Inspect and adjust 檢查、調整
Incorrect wiring (relay product) 接綫錯誤						○	Change wiring 變更接綫

# SPECIFICATIONS

# 規格

MODEL 型號	RATED VOLTAGE 額定電壓 [V]	RATED FREQUENCY 額定頻率 [Hz]	RATED INPUT 額定功率 [W]		AIR VOLUME 排氣量 [m³/h]		NOISE LEVEL 噪音 [dB]		STATIC PRESSURE 靜壓 [Pa]		NET WEIGHT 淨重 [kg]
			Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo	
FV-12NS3H	220	50	18	17	180	145	21	17	115	100	5.5
FV-15NS3H	220	50	33	29.5	340	275	25	22	135	120	6.5
FV-18NS3H	220	50	60	55	500	405	29	27	180	170	8.5
FV-18NF3H	220	50	91	80	770	620	31	29	205	190	10
FV-20NS3H	220	50	120	113	920	720	32	29	295	250	14
FV-23NL3H	220	50	230	170	1200	900	40	34	385	335	18
FV-25NS3H	220	50	345	265	1700	1380	41	38	485	440	24
FV-25NF3H	220	50	390	325	1900	1600	43	40	490	460	24

## SPECIFICATIONS

## 規格

MODEL 型 號	RATED VOLTAGE 額定電壓 [V]	RATED FREQUENCY 額定頻率 [Hz]	RATED INPUT 額定功率 [W]		AIR VOLUME 排氣量 [m³/h]		NOISE LEVEL 噪 音 [dB]		STATIC PRESSURE 靜 壓 [Pa]		NET WEIGHT 淨 重 [kg]
			Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo	
FV-12NS3	220	50	18	17	180	145	21	17	115	100	5.5
	230	50	20	18	180	150	21	18	115	100	
	240	50	22	19	185	155	22	20	115	105	
	230	60	27	20	195	150	23	19	160	135	
FV-15NS3	220	50	33	29.5	340	275	25	22	135	120	6.5
	230	50	35	31	340	280	25	22	135	120	
	240	50	37	33	350	290	26	24	135	125	
	230	60	46	36	375	280	28	23	190	170	
FV-18NS3	220	50	60	55	500	405	29	27	180	170	8.5
	230	50	65	58.5	500	420	30	28	185	175	
	240	50	68	62.5	510	430	31	28	190	180	
	230	60	79	67.5	510	400	32	27	260	240	
FV-18NF3	220	50	91	80	770	620	31	29	205	190	10
	230	50	96	82	770	620	32	29	210	190	
	240	50	104	86	780	640	33	29	210	190	
	230	60	129	96	760	620	32	29	280	260	
FV-20NS3	220	50	120	113	920	720	32	29	295	250	14
	230	50	125	120	930	750	33	30	295	255	
	240	50	135	125	940	790	34	31	300	255	
	230	60	169	137	880	660	33	27	400	350	
FV-23NL3	220	50	230	170	1200	900	40	34	385	335	18
	230	50	250	180	1200	900	40	35	395	355	
	240	50	260	190	1250	950	41	37	405	360	
	230	60	339	216	1200	860	41	33	495	450	
FV-25NS3	220	50	345	265	1700	1380	41	38	485	440	24
	230	50	350	270	1720	1380	42	39	500	455	
	240	50	370	290	1750	1450	44	40	515	470	
	230	60	467	334	1700	1350	42	40	660	595	
FV-25NF3	220	50	390	325	1900	1600	43	40	490	460	24
	230	50	410	335	1910	1600	45	41	505	475	
	240	50	430	360	1920	1620	46	42	520	490	
	230	60	545	420	1850	1460	43	41	700	625	

## Notes:

1. The values of rated input, air volume and noise are specified at the static pressure of 0 Pa.
2. The values of noise level is A weighted average sound pressure level, the mean value are measured by our company, within +3 and -7 tolerance.
3. The values of noise level are measured at the 1.5m apart from the side of the fan body when ducts are connected on both inlet and outlet side.  
It is on the assumption that the noise of fan body propagates to room inside.
4. The values of air volume are the mid-points of results measured by our company, with  $\pm 10\%$  tolerance.

## 注意:

1. 排氣量、電氣特性、噪音值等數據是在靜壓為0Pa狀態下的數值。
2. 噪音值是A計權平均聲壓級，是本公司測試結果的中心值，有+3，-7的公差範圍。
3. 噪音值是在機體側面1.5m處測得的值（機體進風口，出風口兩側分別連接導風管）。  
此測試方法是在假設機體的噪音傳到室內的情況下設定的。
4. 排氣量是本公司測試排氣量結果的中心值，有 $\pm 10\%$ 的公差範圍。

\* Insulation class E E級絕緣

Panasonic Corporation

<http://panasonic.net>

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