MV510series Medium-Voltage Inverter

MV510 系列中壓變頻器

Maintenance Manual

維護手冊

Taian Technology (Wuxi) Co., Ltd.

(TECO Group)

Chapter I Safety Precautions
第一章安全注意事項

⚠ Safety Precautions.
安全注意事項

1.1 Please read this manual carefully prior to use of the product.
使用本產品前請仔細閱讀本說明書。

1.2 Be sure to follow instructions in this manual during use of the medium-voltage equipment with medium-voltage AC power inside that may lead to personal injury.
使用內部裝有中壓交流電源的中壓設備時，請務必按照本手冊的說明操作，以免造成人身傷害。

1.3 Please abide by instructions for various models during transportation or operation. Otherwise, personal injury may be caused.
各型號在運輸或使用時請遵守使用說明。否則可能造成人身傷害。

1.4 Protect the VFD or its outer package from seawater or rainwater during transportation or storage.

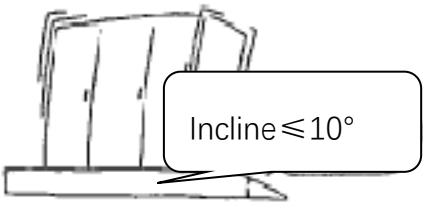
Otherwise，seawater or rainwater may enter the VFD and lead to damage.

VFD 或其外包裝在運輸或儲存過程中不受海水或雨水侵蝕。否則，海水或雨水可能會進入 VFD 造成損壞。

1.5 Check the marked weight of this VFD and select a proper crane for suspension and movement of this VFD. Please follow the operating structions to avoid personal injury.

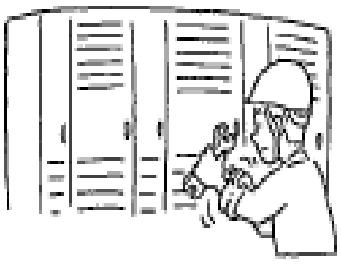
檢查該變頻器的標記重量，並選擇合適的起重機進行懸掛和移動。請按照操作說明操作，避免人身傷害。

1.6 Do not incline this VFD forward or backward by over 10 degrees during installation. Otherwise, the VFD may slide down and lead to injury.
在安裝過程中不要將 VFD 向前或向後傾斜超過 10 度。否則，VFD 可能會下滑而導致損傷。



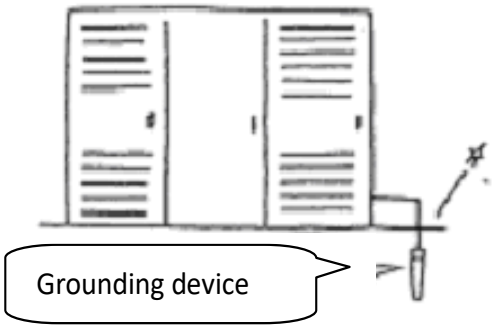
1.7 Keep balance under instruction of the work supervisor during transportation with roller. Otherwise, the VFD may slide down and lead to injury.
在輥子運輸過程中，在工作主管的指導下保持平衡。否則，VFD 可能會下滑而導致損傷。

1.8 The user is not allowed to modify or move this VFD without permission. Except professionals, others modifying or moving the VFD may lead to electric shock, injury or fault.
使用者不允許在未經允許的情況下修改或移動該 VFD。除專業人員外，其他人修改或移動變頻器可能導致電擊、傷害或故障。



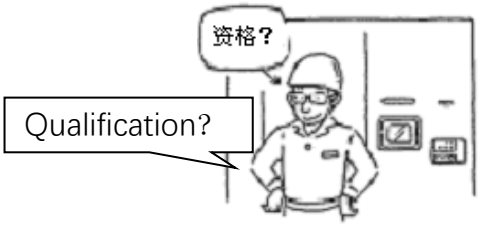
1.9 Ensure the VFD is earthed. Otherwise, the decreased insulating capacity may lead to electric

leakage or shock.
確保變頻器接地。否則，降低的絕緣效力可能會導致漏電或觸電。

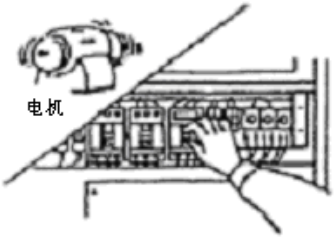


1.10 The system parameters must be correctly set by the qualified personnel, as the system may be overloaded and damaged if the wrong parameters are set.
系統參數必須由專業人員正確設置，否則可能導致系統超載和損壞。

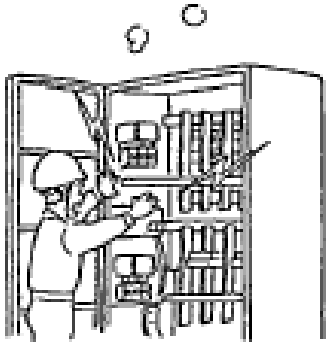
1.11 Only the qualified and trained personnel with proper safety measures are allowed to operate this VFD. Electric shock, injury or fault may be caused if it is operated by any person not qualified or trained.
只允許有資格和受過適當安全措施培訓的人員操作本變頻器。由未經培訓的人員操作，可能會造成電擊、傷害或故障。



1.12 It is prohibited to switch off the main power and control power supply during operation of the drive and normal operation of the motor. Otherwise, the drive may break down.
變頻器運行和電機正常運行時，禁止切斷主電源和控制電源。否則，可能會導致變頻器故障。

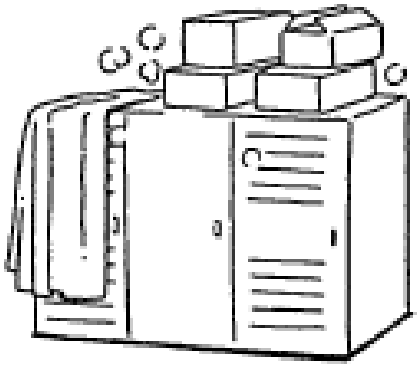


1.13 Do not open the cabinet door when the VFD is charged or has residual voltage.
VFD 帶電或有剩餘電壓時，請勿打開櫃門。



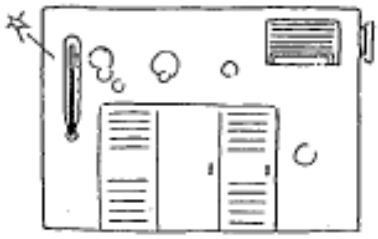
1.14In case of fire, please turn the circuit breaker of medium-voltage power and control power to the OFF position immediately, and do not attempt to use the VFD. Otherwise, fire may be caused.
如發生火災，請立即將中壓電源斷路器和控制電源開關置於 OFF 位置，不要嘗試使用變頻器。否則可能引起火災。

1.15Do not block the air vents in the front, on the top and by the side of the equipment. Otherwise, internal temperature of the equipment may increase and lead to fault.
禁止堵塞設備前面、頂部和側面的通風口。否則，可能會導致設備內部溫度升高，導致設備故障。

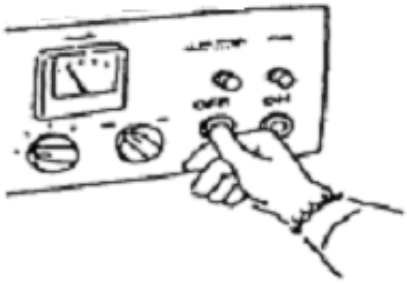


1.16Please read the warning sign on the drive prior to operation. Otherwise, electric shock or injury may be caused.
操作前請閱讀驅動器上的警告標誌。否則可能導致電擊或人身傷害。

1.17Do not stop air conditioner in the VFD room during operation. Otherwise, the room temperature may raise and lead to failure of the drive.
VFD 室內空調運行時，請勿關閉。否則，可能會導致室溫升高，導致變頻器故障。



1.18Turn the circuit breaker of medium-voltage power and control power to the OFF position prior to cleaning or inspection.
清潔或檢查前，先將中壓電源斷路器和控制電源開關置於 OFF 位置。



1.19Do not touch the rotating cooling fan, or injury may be caused.
請勿觸摸旋轉的冷卻風扇，否則可能造成傷害。

1.20Do not take out any module rapidly from the rack, or apply excessive force to any side of the module after it is pulled out. Otherwise, the module may fall from the rack, leading to deformation, injury or failure.
請勿將功率單元快速從機架上拔出，也不要在拔出後對單元的任意一側用力過大。否則可能導致單元

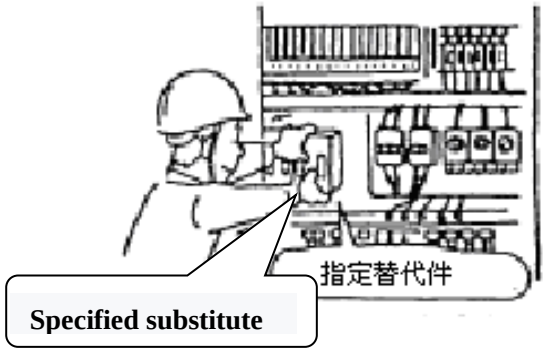
從機架上掉下，導致變形、損壞或失效。

1.21Please contact us timely in case of faults of operation. We will provide remote assistance or assign maintenance engineers to your site for solving the problem.

如發生操作故障，請及時與我們聯繫。我們將提供遠端協助或指派維護工程師到您的現場解決問題。

1.22Please use the replacement parts specified by us. Otherwise, burning, electric shock, injury or failure may be caused.

請使用我們指定的更換部件。否則可能導致燒傷、觸電、損傷或故障。



Note: Please strictly follow the above safety specifications for operation. Otherwise, VFD damage and personal injury may be caused.

注:請嚴格按照以上安全規範操作。否則可能造成 VFD 損壞和人

Chapter II Equipment maintenance

第二章 設備維護

MV510 series medium voltage VFD generally consists of various cabinets as listed below (from left to right):

MV510 系列中壓變頻器一般由以下各種機櫃組成(從左至右)：

- Transformer cabinet(變壓櫃)
- Power cell cabinet(功率單元櫃)
- Control cabinet(控制櫃)

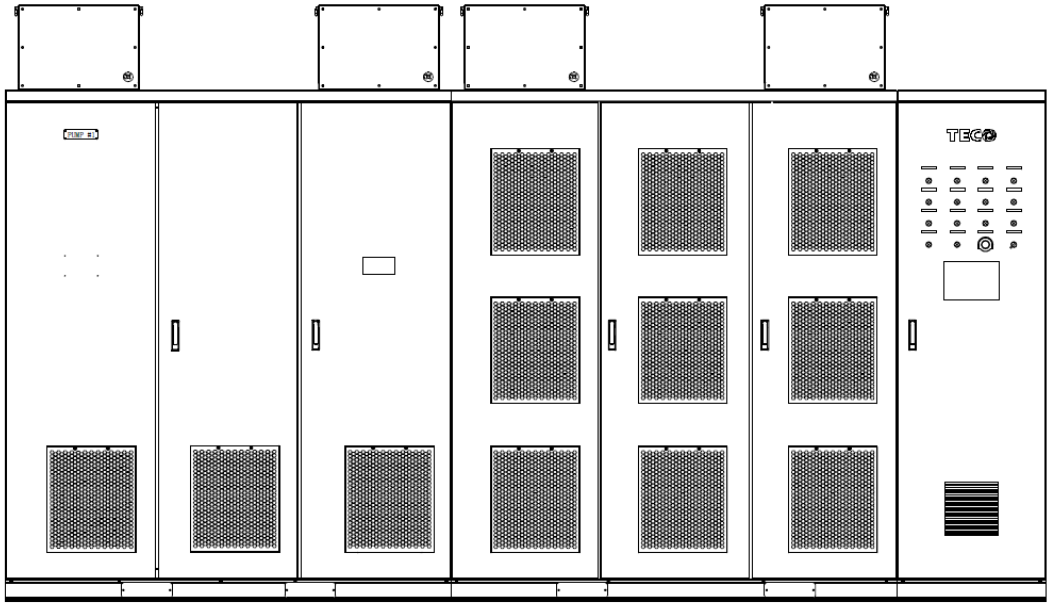


Diagram 1-1

Note:

This diagram is only the external dimensions of the company's product selection MV510-F66/200-S00 (6.6kV 2250kVA). Due to the different capacity of the inverter, the cabinet size will change accordingly. Please refer to the random size for detailed dimensions. Equipped with outline drawing.

注：此圖僅為本公司產品選型 MV510-F66/200-S00 (6.6kV 2250kVA)的外觀尺寸。由於變壓器的容量不同，機櫃的大小也會相應變化。詳細尺寸請參考隨機外形圖。

Electronic equipment cannot be used permanently, even in normal working conditions, if it exceeds the service life, it will produce characteristic changes or malfunction. In order to prevent such failures, preventive maintenance such as daily inspections, periodic inspections and deep inspections must be performed.

電子設備不能永久使用，即使在正常工作條件下，如果超過使用壽命，就會產生特性變化或故障。為了防止此類故障，必須進行預防性維護，如日常檢查、定期檢查和深度檢查。

The medium-voltage inverter is composed of IGBT (Insulated Gate Bipolar Transistor), semiconductor components such as IC, electronic components such as capacitors and resistors, and various components such as fans and relays. If all of these components do not function properly, you will not be able to perform the functions your product should have.

中壓變頻器由 IGBT(絕緣柵雙極電晶體)、IC 等半導體元件、電容、電阻等電子元件以及風扇、繼電器等各種元器件組成。如果所有這些元件都不能正常工作，您將無法完成您的產品應有的功能。

Please follow the checklists in this section to perform regular inspections.

請按照本章列出的檢查清單進行定期檢查。

Note: When installing the medium-voltage inverter in the following environment, shorten the periodic inspection cycle as compared with the normal case.

注:在以下環境中安裝中壓變頻器時，應縮短定期檢查週期。

- High temperature environment
  - 高溫環境
- Frequent start and stop environment
  - 頻繁的啟停環境
- Frequent power on and off environment
  - 頻繁的電源開關環境
- Environment with AC power or load fluctuations
  - 交流電源或負載波動環境
- An environment with excessive vibration or shock
  - 振動或衝擊過大的環境
- Environment with dust, metal dust, salt, sulfuric acid and chlorine
  - 粉塵、金屬粉塵、鹽、硫酸、氯等環境
- Storage in a poor environment
  - 儲存環境惡劣

◆ 2.1 Daily inspection 日常檢查

The daily inspection of our medium-voltage inverter is shown in Table 2.1. In order to avoid malfunction of the medium-voltage inverter and product damage, please confirm the following items every day.

中壓變頻器的日常檢查如表 2.1 所示。為了避免中壓變頻器故障和產品損壞，請每天確認以下事項。

Table 2.1 Daily Checklist (Overall)

表 2.1 日常檢查表(總體)

Check item	Inspection matters	Check bar
Surroundings 環境	Is the ambient temperature normal?(0-40℃) 室溫是否正常? (0-40℃)	
	Is the humidity normal?(<90%,No condensation) 濕度是否正常,有無冷凝現象?(<90%)	
	Are there any harmful gases? 有有害氣體嗎?	
	Are dust, oil mist, etc. attached? 有灰塵、油霧附著嗎?	
Overall device 總體外觀	Are there any abnormal sounds and vibrations? 有什麼異常的聲音和振動嗎?	
	Is there any smell? 有什麼異味嗎?	
Transformer 變壓器	Is the transformer temperature normal? 變壓器溫度是否正常？	
HMI 人機操作介面	The touch screen displays whether it is clear and whether characters are missing？ 觸控式螢幕顯示是否清晰，字元是否缺失?	
	Are the parameters displayed normal? 顯示的各項參數是否正常?	
	Is the unit temperature normal? 單元溫度是否正常?	
Circuit 電回路	Is there any abnormality between the protection circuit and the display circuit? 保護電路和顯示電路是否有異常?	
	Whether the main circuit voltage and the control voltage are normal (Measured by meter or unit operating voltage displayed through HMI)？ 主回路電壓和控制電壓是否正常(用儀錶或通過 HMI 顯示的單元工作電壓測量判斷)？	
Indicator light 指示燈	Is the display normal? 顯示是否正常?	
LV Control component 低壓控制元件	Are the electronic components working properly? 各電子元器件是否正常工作？	

◆ 2.2 Periodic inspection 定期檢查

The periodic inspection of our medium-voltage inverter is shown in Table 2.2. Under normal circumstances, it is recommended to conduct regular inspections every 6 to 12 months, but please determine the actual inspection frequency in combination with the actual use and working environment of each inverter. Regular inspections help prevent medium-voltage inverters from functioning and product damage.

中壓變頻器的定期檢修如表 2.2 所示。一般情況下，建議每 6-12 個月定期檢查一次，但實際檢查頻率請結合各變頻器的實際使用情況和工作環境確定。定期檢查有助於防止中壓變頻器運行和產品損壞。

➢ Regular maintenance inspection general steps
定期維護檢查一般步驟

(1) Cut off all power supplies of the medium-voltage inverter: cut off the main power and control power of the medium-voltage inverter, UPS power off;
切斷中壓變頻器所有電源:切斷中壓變頻器主電源和控制電源，關閉 UPS 電源;

(2) Wait for more than 15 minutes, confirm the implementation of item (1), and confirm the discharge of the power cell;
等待 15 分鐘以上，確認執行第(1)項，確認功率單元放電完成;

(3)Confirm that the switch has been reliably disconnected and grounded;
確認開關斷開並可靠接地;

(4)Open the medium-voltage inverter cabinet door and check the inspection item list item by item (refer to the periodic inspection table);
打開中壓變頻櫃門，逐項檢查檢查項目清單(參考定期檢查表);

(5)Confirm maintenance inspection work;
確認維修檢查工作;

(6)Confirm that the maintenance work is completed;
確認維修工作已完成;

(7)Confirm that the power supply is connected correctly and reliably;
確認電源連接正確可靠;

(8)Confirm that the tools are not in the cabinet;
確認工具不在機櫃內;

(9)Close and lock the door, re-power on, and confirm the maintenance;
關閉門鎖，重新上電，確認維修;

(10)Fill in the maintenance inspection report and file it.
填寫檢修報告並存檔。

 Danger: To prevent electric shock
危險:防止觸電

Do not perform inspections while the main circuit power supply and control power are on. Otherwise there is a danger of electric shock.
不要在主電路電源和控制電源接通時進行檢查。否則有觸電的危險。

Please turn off the power of all devices before checking. Even if the main circuit

power supply is cut off, there is residual voltage in the capacitor inside the medium voltage inverter. **Wait for more than 15 minutes after turning off the power.**

檢查前請關閉所有設備的電源。即使切斷主電路電源，中壓逆變器內部的電容器內仍有殘餘電壓。**關閉電源後，請等待 15 分鐘以上。**

Table 2.2 Periodic inspection table

表 2.2 定期檢查表

Check parts	Check item	Inspection matters	Inspection methods and criteria	Check bar
Overall 總體		Are there any water stains inside the cabinet? 櫃體內部有無水漬？	Visual/Instrument inspection: no damage, no pollution, no abnormalities. 目視/儀器檢驗: 沒有傷害, 沒有污染, 沒有異常	
		Are bolts、nuts and all the parts loose? 螺栓、螺母和各零件是否鬆動?		
		Is there any damage or discoloration of parts caused by overheating or aging? 零件因過熱或老化有什麼損傷，變色?		
		Are sundries and dust attached? 有雜物還有灰塵附著嗎?		
Transformer & Power cell 變壓器和功率單元	Transformer 變壓器	Check for anything abnormal in the external appearance. 檢查外觀是否異常。	Visual/Instrument inspection: no damage, no pollution, no abnormalities. 目視/儀器檢驗: 沒有傷害, 沒有污染, 沒有異常	
		Is the coil part and insulation paper damaged? 線圈和絕緣紙損壞了嗎?		
		Is the coil deformed? Does the insulation layer change color? 線圈是否變形？絕緣層是否變色?		
		Is there any dust or foreign matter on the coil part? 線圈部分是否有灰塵或異物?		
	Power cell 功率單元	Is the series copper bar and fixing screw loose? 串聯銅排和螺絲鬆動了嘛？		
		Is the signal transmission fiber loose? And replug it. 信號傳輸光纖是否鬆動?並重新插拔。		
		Is the optical fiber flush with		

		the optical fiber head? 光纖與光纖頭是否平齊？		
		Is there any dirt or dust on the heatsink? 散熱片上有灰塵嗎?		
	Wire 線纜	Is the wire insulating layer damaged or aged? 電線絕緣層是否損壞或老化?		
Control section 控制部分	Relay 繼電器	Is there any high frequency vibration when moving? 運轉時是否有高頻振動?	Visual inspection: no damage, no pollution, no abnormalities. 目視/儀器檢驗: 沒有傷害, 沒有污染, 沒有異常。	
		Is the timer's operating time normal? 計時器的工作時間是否正常?		
		Is the contact loose? 接觸是否鬆動?		
		Is the buckle in good condition? Is the label complete? 卡扣是否完好?標籤是否完整？		
	Circuit board 電路板	Is there any smell or discoloration? 有什麼氣味或變色嗎?		
		Is the power supply normal? 電源是否正常?		
		Are the resistors and plugs loose? 這些電阻和插頭鬆動嗎?		
	Switch 開關	Is the switch action normal? 開關動作正常?		
Cabinet Door 櫃門	Door strainer 櫃門濾網	Is it dirty or clogged? 髒或是堵塞?	Visual inspection: no damage, no pollution, no abnormalities. 目視/儀器檢驗: 沒有傷害, 沒有污染, 沒有異常。	
	Door 櫃門	Is there deformation damage? 有無變形損傷?		
		Is the grounding wire of the cabinet door intact? And secure? 櫃門接地線是否完好？並固定牢靠?		

◆ 2.3Deep inspection 深度檢查

The periodic inspection of our medium-voltage inverter is shown in Table 2.2. Under normal circumstances, it is recommended to conduct deep inspections every 2~3years, but please determine the actual inspection frequency in combination with the actual use and working environment of each inverter. Regular inspections help prevent medium-voltage inverters from functioning and product damage.

中壓變頻器的深度檢修如表 2.3 所示。一般情況下，建議每 2-3 年定期檢查一次，但實際檢查頻率請結合各變頻器的實際使用情況和工作環境確定。定期檢查有助於防止中壓變頻器運行和產品損壞。

- Deep maintenance inspection general steps
  深度維護檢查一般步驟

(1) Cut off all power supplies of the medium-voltage inverter: cut off the main power and control power of the medium-voltage inverter, cut off the UPS power;
切斷中壓逆變器所有電源:切斷中壓逆變器主電源和控制電源，關閉 UPS 電源;

(2)Wait for more than 15 minutes, confirm the implementation of item (1), and confirm the discharge of the power cell;
等待 15 分鐘以上，確認執行第(1)項，確認電池放電;

(3)Confirm that the switch has been reliably disconnected and grounded;
確認開關已可靠斷開接地;

(4)Open the medium-voltage inverter cabinet door and check the inspection item list item by item (refer to the periodic inspection table);
打開中壓逆變櫃門，逐項檢查檢查項目清單(參考定期檢查表);

(5)Confirm maintenance inspection work;
確認維修檢查工作;

(6)Confirm that the maintenance work is completed;
確認維修工作已完成;

(7)Confirm that the power supply is connected correctly and reliably;
確認電源連接正確可靠;

(8)Confirm that the tools are not in the cabinet;
確認工具不在機櫃內;

(9)Close and lock the door, re-power on, and confirm the maintenance;
關閉門鎖，重新上電，確認維修;

(10)Fill in the maintenance inspection report and file it.
填寫檢修報告並存檔。

 Danger: To prevent electric shock

危險:防止觸電

Do not perform inspections while the main circuit power supply and control power are on. Otherwise there is a danger of electric shock.

不要在主電路電源和控制電源接通時進行檢查。否則有觸電的危險。

Please turn off the power of all devices before checking. Even if the main circuit power supply is cut off, there is residual voltage in the capacitor inside the medium voltage inverter. **Wait for more than 15 minutes after turning off the power.**

檢查前請關閉所有設備的電源。即使切斷主電路電源，中壓逆變器內部的電容器內仍有殘餘電壓。**關閉電源後，請等待 15 分鐘以上。**

Table 2.3Deep inspection table

表 2.3 深度檢查表

Check parts	Check item	Inspection matters	Inspection methods and criteria	Check bar
Transformer & Power cell 變壓器和功率單元	Overall 總體	Check with megger (between main circuit terminal and ground terminal) 用兆歐表檢查(在主回路和接地端子之間)	Visual/Instrument inspection: no damage, no pollution, no abnormalities. 目視/儀器檢驗: 沒有傷害, 沒有污染, 沒有異常。	
	Power cell 功率單元	Does the capacitor leak liquid? 電容是否漏液?		
		Is the safety valve of the capacitor extended? 電容的安全閥是否打開?		
		Does the capacitor expand? 電容會膨脹嗎?		
		Is the main circuit fuse and the control fuse on the board normal? 主機板上的主電路保險絲和控制保險絲是否正常?		
Cooling system 冷卻系統	Cooling fan 冷卻風扇	Is the bearing normal? Is there shaking in manual rotation? 軸承正常嗎? 手動轉動是否有晃動？	Visual inspection: no damage, no pollution, no abnormalities. 目視/儀器檢驗: 沒有傷害, 沒有污染, 沒有異常。	

Please perform deep inspection as follows.
請進行如下定期檢查。

■Inspection with megohmmeter (insulation measurement)

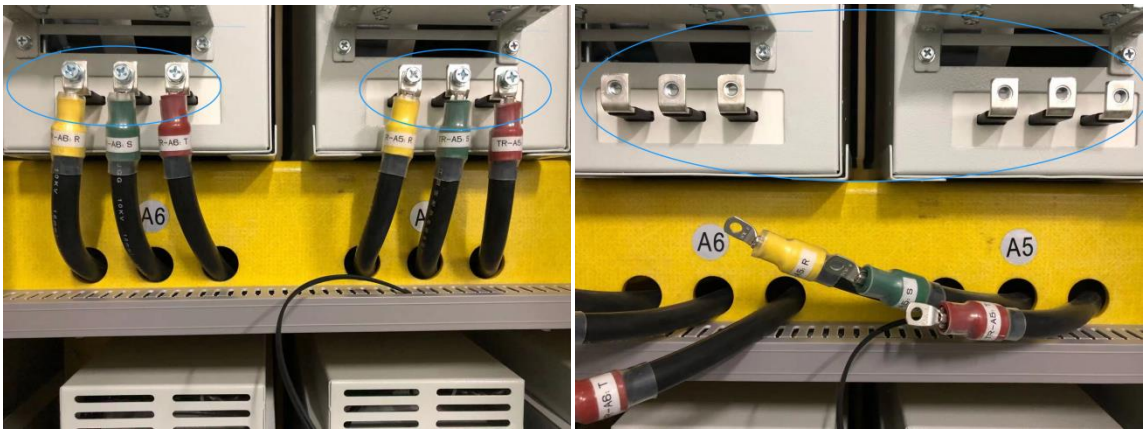
用兆歐表檢查(絕緣測量)

Please use a 2500V megohmmeter. The acceptance criteria are 2500 MΩ or more. The steps are as follows:

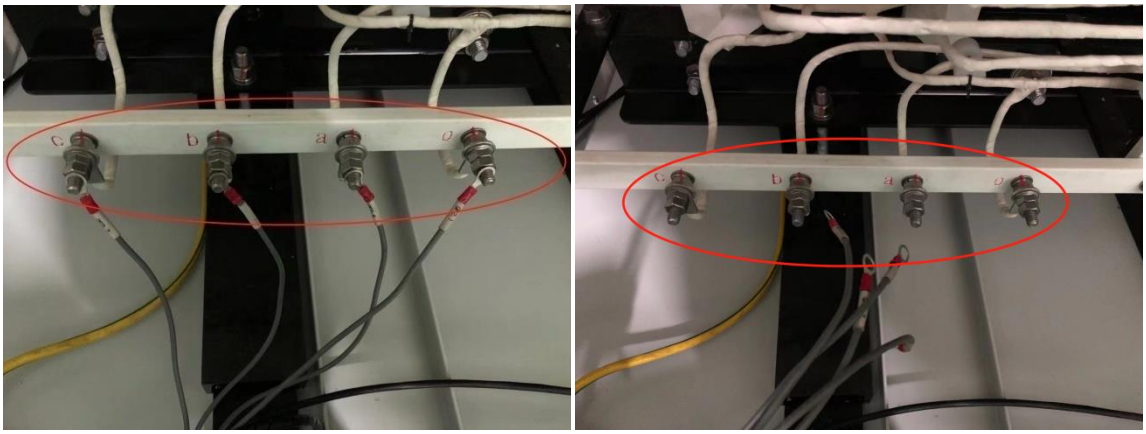
請使用 2500V 兆歐表。驗收標準是 2500 MΩ 或更多。步驟如下:

Step 1:Remove the following cables 拆除如下線纜

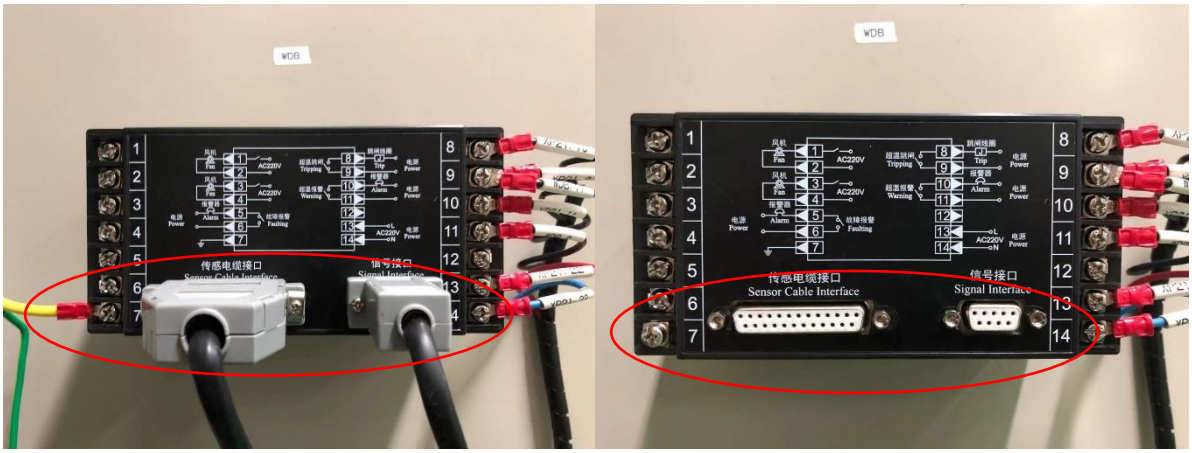
- VFD Input/output voltage detection cable;輸入/輸出電壓檢測線
- Transformer auxiliary winding cable;變壓器輔助繞組線
- Power cell input(R,S,T) cable;單元輸入(R、S、T)線
- Lightning arrester cable;避雷器線
- Temperature controller;溫控儀線
- PT100;溫度檢測探頭
- Transformer core;變壓器鐵芯



(Step1:Power cell Input terminal)
(單元輸入端)

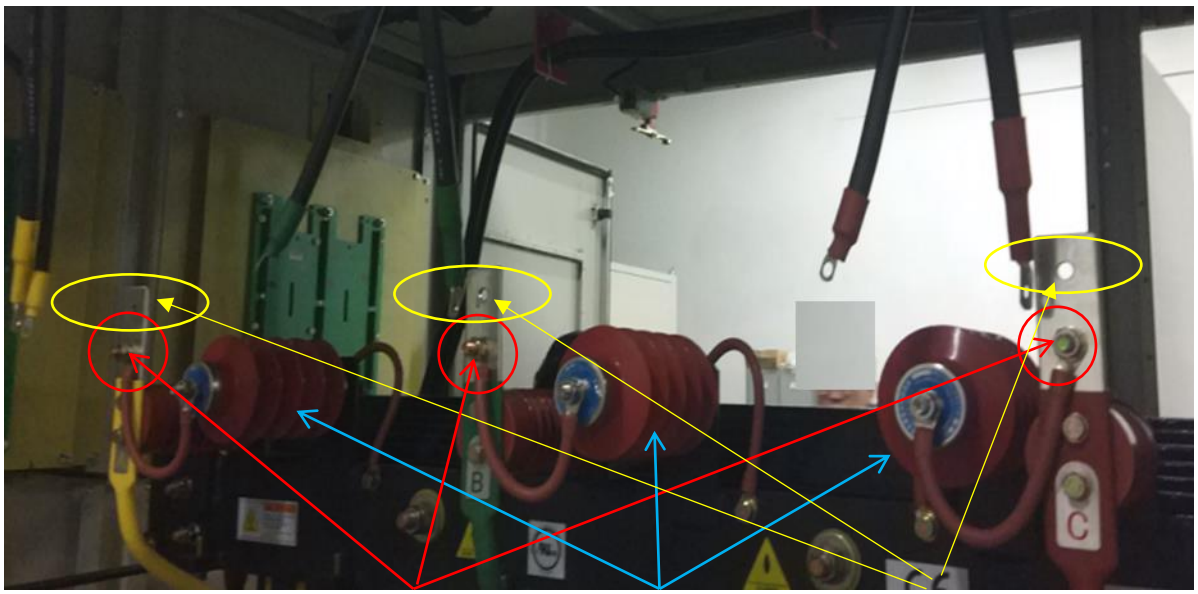


(Step1:Transformer auxiliary winding)
(變壓器輔助繞組)

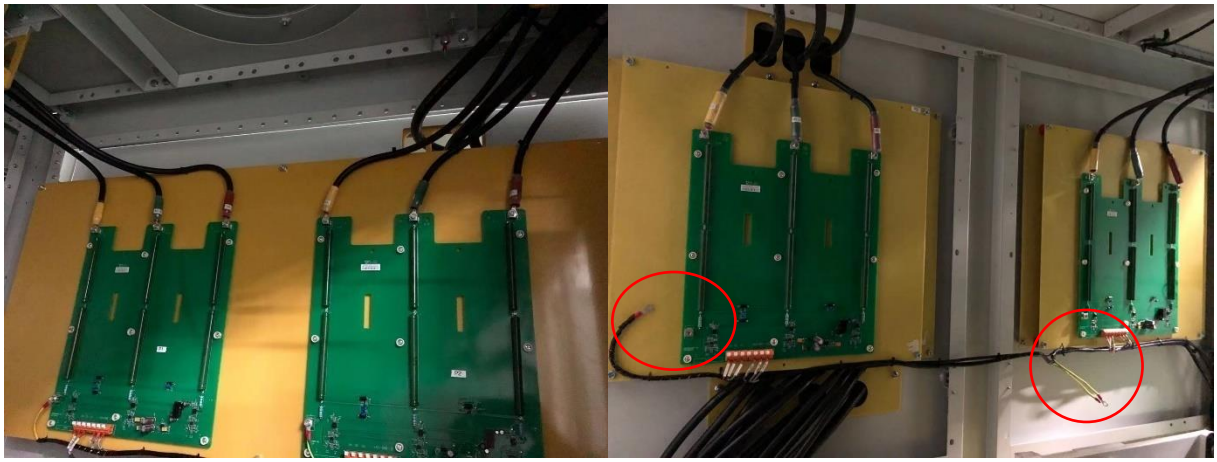


(Step1:Temperature controller)
(溫控儀)

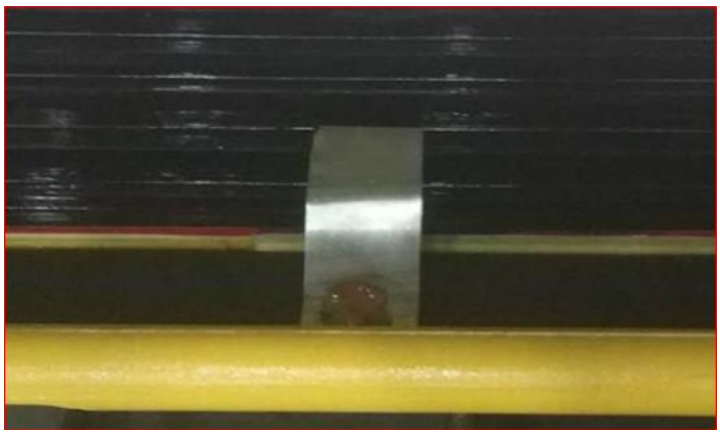
(Step1:PT100)



(Step1: Wire of Lightning Arrester 避雷器接線　Lightning arrester 避雷器　TR Input cable 變壓器輸入線)



(Step1:Voltage detection board)
(電壓採樣板)



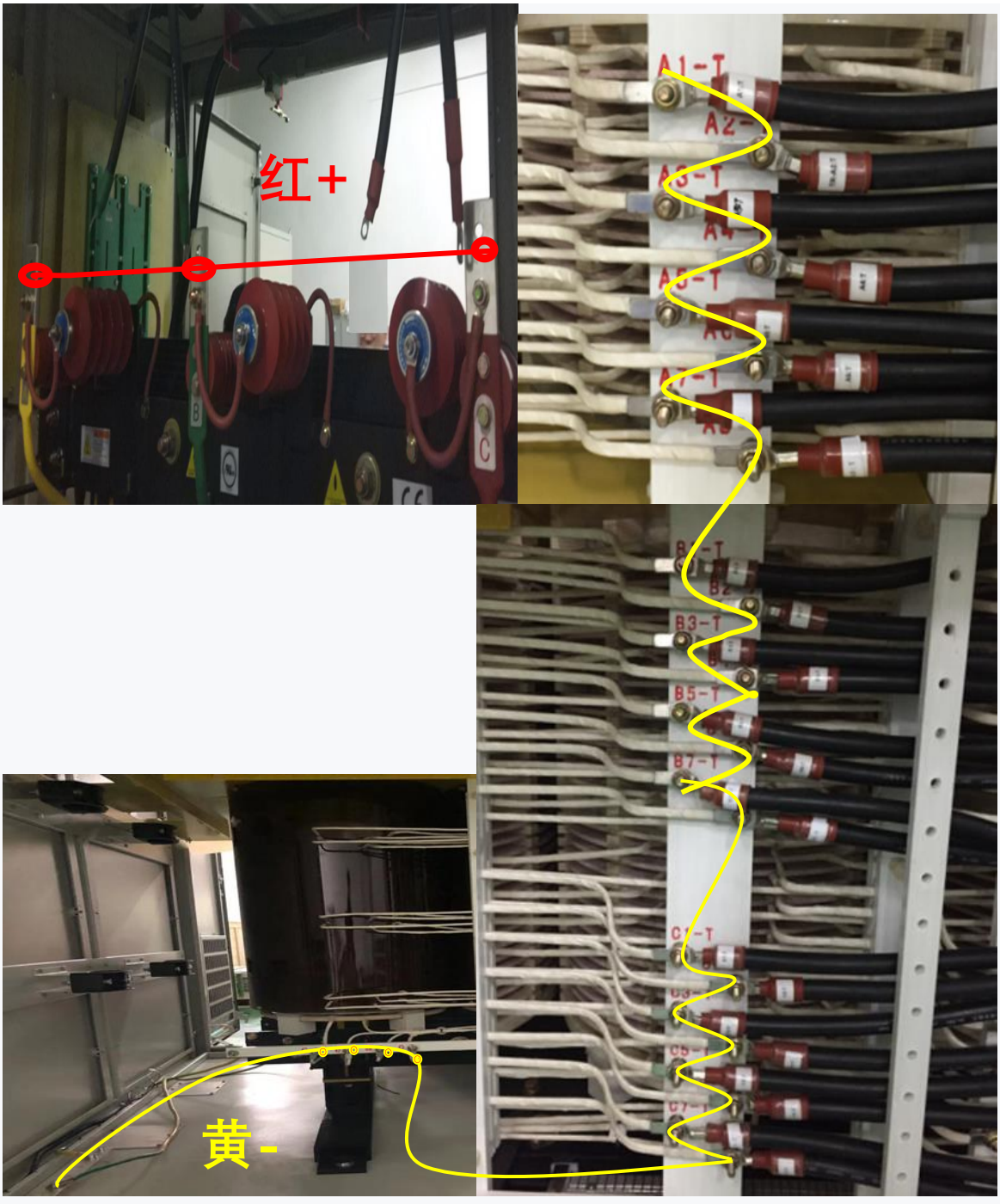
(Step1:Transformer core)
(變壓器鐵芯)

➢ Step 2: High voltage to LV, auxiliary winding and Ground.
高壓對低壓、輔助和地

Short connect the input of TR with copper wire（+）, and then short all output LV terminals，auxiliary winding and ground together（-）.

用銅絲將變壓器三相輸入短接（+），再將所有低壓端子、變壓器副邊和地短接在一起（-）。

Please refer to the pictures shown in Figure 2-3-1.
如圖 2-3-1 所示。

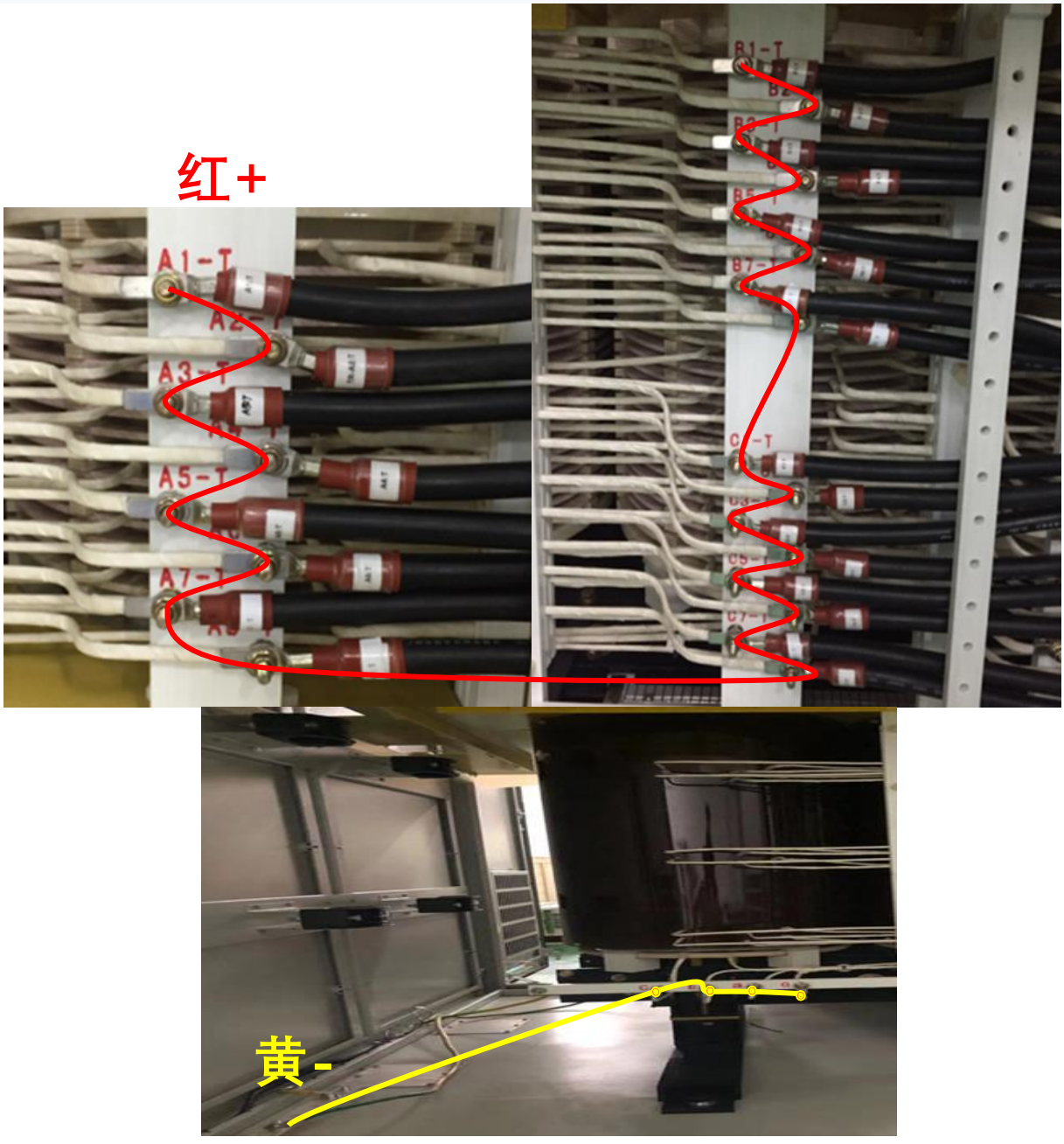


2-3-1

➢ Step 3: LV to auxiliary winding and GND
低壓對輔助、地

Short all LV terminals（+）. Short auxiliary winding and GND（-）.
將所有低壓埠用銅絲短接（+），變壓器副邊和地短接（-）。

Please refer to the pictures shown in Figure 2-3-2.
如圖 2-3-2 所示。



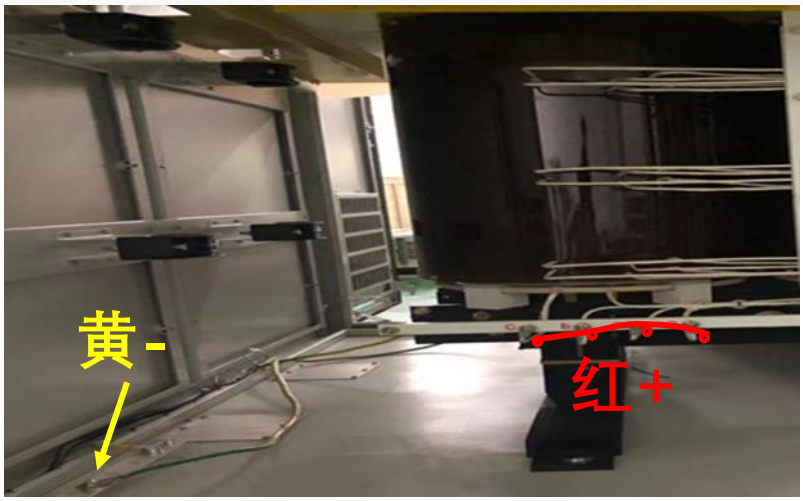
2-3-2

➢ Step 4: Auxiliary winding to GND
輔助繞組對地

Short all auxiliary windings. Connect insulation test device with auxiliary winding （+）and GND（-）.

將變壓器副邊（輔助繞組）用銅絲短接，再用絕緣測試儀兩端探頭分別接到變壓器副邊（+）與接地端（-）.

Please refer to the pictures shown in Figure 2-3-3.
如圖 2-3-3 所示。

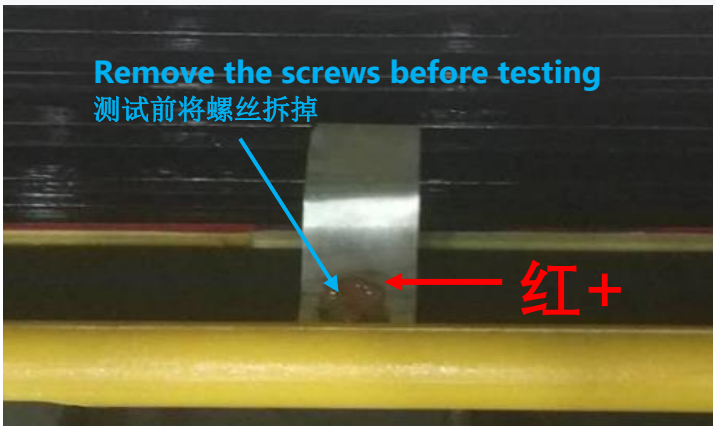


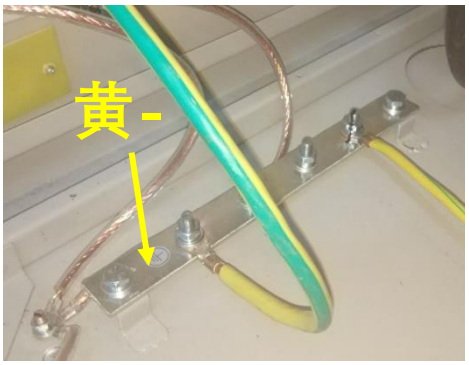
2-3-3

➢ Step 5: Core to GND
鐵心對地

Connect insulation test device with Core（+）and GND（-）.
用測試儀兩端探頭分別接到鐵心端（+）與地端（-）.

Please refer to the pictures shown in Figure 2-3-4.
如圖 2-3-4 所示。





Take good care of screws and nuts after removal.
拆除後保管好螺絲和螺母。

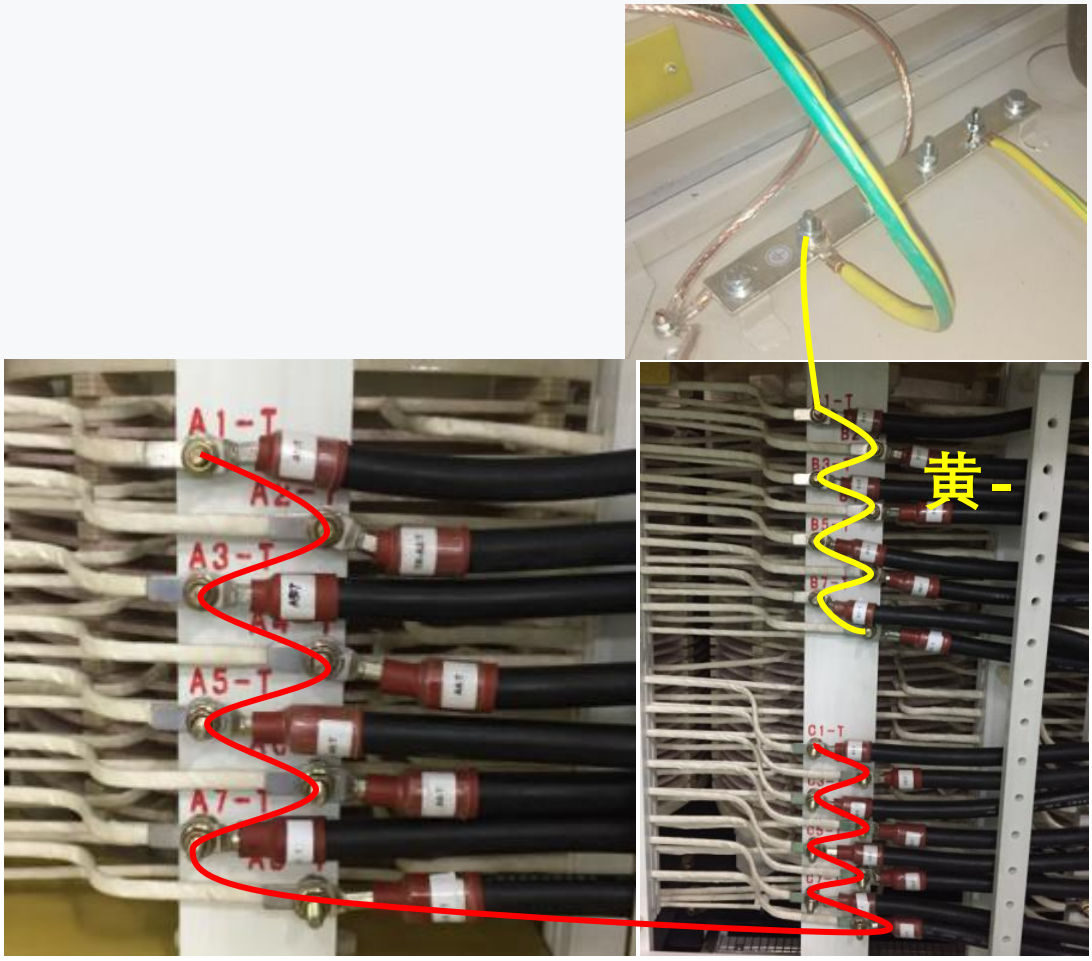
2-3-4

➢ Step 6: LV among phases
低壓餅間

Short all terminals of Phase A and Phase C（+）. Short all terminals of Phase B and GND（-）.

將 A 和 C 兩相所有接線端子用銅絲短接一起(+)，B 相所有接線端子和接地銅排用銅絲短接(-).

As shown in Figure 2-3-5
如圖 2-3-5 所示



2-3-5

■Screws, bolts and connectors 螺釘、螺栓、連接器

If the connection of the main circuit wires is loose, it may cause a fire due to overheating of the wire connections. When performing regular inspections, be sure to tighten the screws and bolts again

如果主電路電線的連接是鬆散的，它可能引起火災，由於電線連接過熱。定期檢查時，一定要重新擰緊螺釘和螺栓

Tightening torque(擰緊力矩):
M5 bolts: 2.5 to 3.5 N·m
M6 bolts:4.4 to 6.6 N·m
M8 bolts: 8.9 to 10.8 N·m
M10 bolts: 18 to 23 N·m
M12 bolts: 31.5 to 39.5 N·m
M16 bolts: 78.5 to 98 N·m

Check the following areas 請檢查以下部位:

·Inverter input terminal, Inverter output terminal
逆變輸入端、逆變輸出端

·Input voltage detection circuit (option), output voltage detection circuit
輸入電壓檢測電路(選配)，輸出電壓檢測電路

·Transformer primary terminal, primary voltage tap terminal
變壓器一次端子，一次電壓抽頭端子

·Transformer secondary terminal
變壓器二次端子

·Power cell input and output terminals, fiber optic cable connectors
電池輸入和輸出端子，光纖電纜連接器

·Power cell screws, bolts and connectors
功率單元螺釘、螺栓和連接器

·Control power input terminal
控制電源輸入端子

·Control transformer input terminal and output terminal (optional)
控制變壓器輸入端和輸出端(可選)

·Power relay input and output terminal for cooling fan
冷卻風扇的電源繼電器輸入輸出端子

·Various control circuit board screws, bolts and connectors
各種控制電路板螺絲、螺栓和連接器

·Control input terminal, output terminal
控制輸入端、輸出端

◆ 2.4 Component replacement 元件更換

In order to maintain the normal operation of the inverter for a long time, it is necessary to check and replace the parts according to the durability of the consumables. The approximate standard for periodic inspection varies depending on the setting environment and usage of the inverter. Please refer to Table 2.2 for regular maintenance.

為了保持變頻器長時間的正常運行，需要根據耗材的耐用性對部件進行檢查和更換。定期檢查的近似標準根據逆變器的設置環境和使用情況而不同。定期維護請參見表 2.2。

• For replacement of the cooling fan, refer to “User manual”.
更換冷卻風扇，請參考“用戶手冊”。
• For the replacement of the power cell, refer to “User manual”.
更換功率單元，請參考“使用者手冊”。

For the replacement of following other parts, you need to consult with the company's agent or sales person who purchased this medium-voltage inverter.
如需更換以下其他部件，請諮詢購買該中壓變頻器的公司代理或銷售人員。

·Cooling fan 冷卻風扇
·Contactor for cooling fan 冷卻風扇接觸器
·Power cell capacitor 功率單元電容
·Rectifier 整流器
·IGBT
·Fuse 保險絲
·PCB board PCB 板
·UPS 不斷電供應系統
·Breaker 斷路器
·Relay class 繼電器

Component replacement recommended time 元件更換推薦時間

The standard replacement period for periodic replacement parts is shown in Table 2.4. When replacing, please use our replacement parts that match the model and version of the medium-voltage inverter used.
定期更換部件的標準更換週期如表 2.4 所示。更換時，請使用與中壓變頻器型號和版本相匹配的替換件。

Table 2.4 Recommended replacement period

Device name 設備名稱	Standard replacement years 標準更換週期
Cooling fan 冷卻風扇	Run time 40000 hours(小時)
Electrolytic capacitor 電解質電容	5 years(年)
UPS 不斷電供應系統	5 years(年)

A printed circuit board 印刷電路板	8 years(年)
Fuse 保險絲	10 years(年)
DC power supply 直流電源	10 years(年)

NOTICE: The standard replacement period is based on the conditions listed below. The times stated are for guidance, and the lives of the parts are not guaranteed for these times. Some parts may require more frequents replacement due to poor environments or rigorous use.
Usage conditions for standard replacement period:

- **Ambient temperature: Yearly average of 30℃.**
- **Load factor:80% maximum.**
- **Operation time:12 hours of fewer a day.**

注意:標準的更換期限是基於以下條件。所述的時間是為指導，不保證零件的實際使用壽命。由於惡劣的環境或嚴格的使用，一些部件可能需要更頻繁的更換。
標準更換期使用條件:

- 環境溫度:年平均 30℃
- 負載係數:最大 80%
- 執行時間:每天不超過 12 小時

Note: This manual is applicable to the MV510 series high-voltage inverter produced by Taian Technology (Wuxi) Co., Ltd. Thank you for reading again. Please call our engineering and technical personnel for any questions, we will be happy to help you!

注:本手冊適用于台安科技(無錫)有限公司生產的 MV510 系列高壓變頻器。再次感謝您的閱讀。如有任何疑問，請致電我們的工程技術人員，我們將竭誠為您服務!

ATT：Test method for fan rotation direction 風機轉向測試方法

1. 變頻器上高壓電，風機正常運轉後，斷開 QF3, 繞行至變頻器背面，觀察風機轉向（從左至右）；若旋轉方向錯誤，則更改用戶端 380Vac 控制電相序（XT11　1/2/3）。

When the high voltage is on the VFD and the fan is in normal operation, disconnect QF3, circle to the back of the VFD, and observe the turning of the fan (from left to right);If the rotation direction is wrong, change the client 380VAC control electrical phase sequence (XT11　1/2/3).

2. 變頻器上高壓電，風機正常運轉後，斷開 QF3、QF1, 待風機靜止後重新閉合 QF3, 風機運轉 2S 後，斷開 QF3, 繞行至變頻器背面，觀察風機轉向（從左至右）；若旋轉方向錯誤，則更改 QF2 上端 380Vac 低壓電相序（QF2　1/3/5）。

When the high voltage is on the VFD and the fan is in normal operation, disconnect QF3 and QF1, and close QF3 again after the fan stop running. After 2s operation of the fan, disconnect QF3, and go around to the back of the VFD to observe the turning of the fan (from left to right).If the rotation direction is wrong, change the 380VAC low voltage phase sequence (QF2　1/3/5).

Tips:

若繞行至變頻器背後無法確認風機旋轉方向，可用一張紙貼近櫃門進風口，觀察是否吸附。

If the rotation direction of the fan cannot be confirmed after winding to the back of the VFD, a piece of paper can be used to close to the air inlet of the cabinet door to observe whether it is attached.