HHM/HBM 系列冷凝器安裝與操作說明
HHM/HBM Series User's Manual

Catalog 目錄

1. Check on delivery

When receive the product, please check if there is any damage on packing or product due to shipping. And the content is the same as packing list. If there is any damage, please describe the defect on the delivery note. If possible, take photos on damaged part and send the photos and damage description to your local agent. In order to protect your right and interests, please inform your local agent within 3 days.

2. Storage

Warning! Incorrect storage way could lead to casing damage!
Never place any heavy goods on this product!
Never sit or stand on the container!

Store product in cool and dry place. If corrugated cardboard gets wet, please remove the wet corrugated cardboard as soon as possible! The wet corrugated cardboard might produce corrosive compounds which are aggressive to heat exchanger materials!

If this condenser has been run for a while, for some reason has to unload the unit or shut down the whole system for a long time, please dry and clean the fin surface before storage. If this condenser is disconnected from system, please seal the condenser with dry nitrogen.

1. 收貨檢查

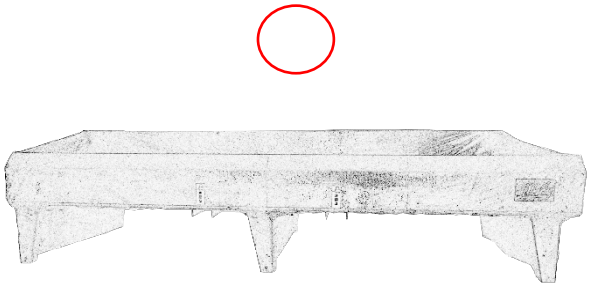
當收到產品時，請檢查產品包裝與產品本身是否有運輸損傷。並請核對產品與送貨單內容是否符合。如果任何損傷，請於送貨單上註明損害情形。可能的話請將受損的部分拍照，並將照片與損害說明傳送到當地經銷商。為了確保您的權益，務請於到貨 3 天內通知您的經銷商。

2. 儲存

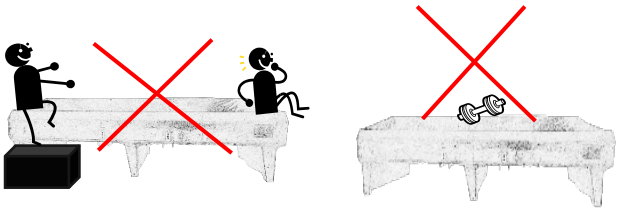
警告！錯誤的存放方式將造成板金受損！
請勿放置任何重物於本產品上！
請勿坐或站立於本產品上！

請將產品放置於涼爽乾燥的位置。如果瓦楞紙包裝潮濕，請迅速將受潮的瓦楞紙板移除。潮濕的瓦楞紙可能會產生有腐蝕性的物質，對熱交換器的材質造成損壞。

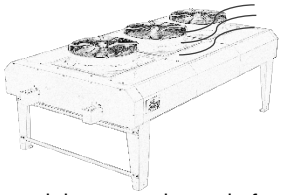
如果冷凝器已經運轉過，在某些情形下必須要將冷凝器取下或是將系統關閉一段長時間，請在儲存前將鰭片清潔乾燥。如果冷凝器由系統拆下，請將冷凝器以乾燥氮氣封存。



Do place product horizontally!
請將產品水平放置！



Do NOT sit or stand or place any heavy goods on condensers!
請勿坐或站立或放置任何重物於本產品上！



Clean and dry up condenser before storage or shut down for a long time if it has been run.
如系統已經運轉過，在儲存或要長時間停機前，請先清潔乾燥！

Select correct forklift and/or crane to unload/hoist this product!

Installation work must be executed by professional technician！

慎選合適的堆高機與/或吊車進行本產品卸貨/吊裝作業！

本產品的安裝作業僅能由專業作業人員執行！

3. Installation

3.1 Unloading/Hoisting at site

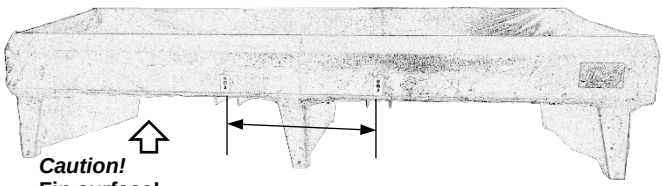
Caution! Please CHECK the capacity of forklift/cane before unloading/hoisting, the unit weight of this product could be found on Appendix 1. Operator of forklift/cane must be qualified.

Be careful for lifting this product, do not damage the fin surface. There are two channel bars (Marked by yellow label) under the condenser for transporting. These bars are for forks and wires to carry this condenser. The distance between bars is 1.2/1.5 meter. Please check the Appendix 1. While using wires to hoist this product, please place protection pads between wires and casing.

Before shipping, all condensers have been pressurized inside to block moisture. While releasing gas via service valve before connection, do watch out the gas blowout.

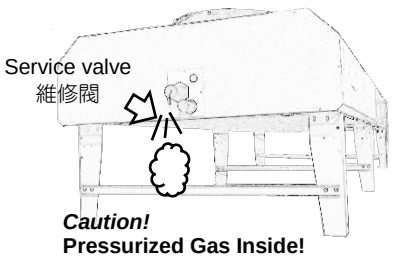
All the packing materials disposal must meet local regulation.

Please check the weight/distance between bars on Appendix 1 before unloading/hoisting.
請於卸貨/吊裝前檢查附錄 1 中所列的重量/U 型槽鐵距離。



Caution!
Fin surface!
小心！鰭片面！

Distance between channel bars is 1.2/1.5m.
U 型槽鐵的距離為 1.2/1.5 公尺。



Caution!
Pressurized Gas Inside!
小心！內封加壓氣體！

3. 安裝

3.1 卸貨/現場吊裝

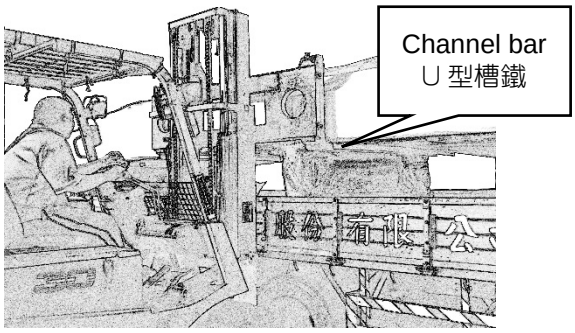
小心！在卸貨/吊裝前請仔細檢查堆高機/吊車的能力是否足夠，本產品的重量可以由附錄 1 查到。堆高機／吊車的作業人員必須要為合格的操作人員。

要昇舉本產品時，請小心不要傷到鰭片面。在冷凝器的下方有兩個搬運用的 U 型槽鐵（以黃色標籤標示），這兩個槽鐵是供堆高機牙插與吊索的支撐，用以舉昇本冷凝器。此兩個槽鐵的距離為 1.2/1.5 公尺，請參考附錄 1。使用吊索吊裝時，請在吊索與箱體間放置保護墊，避免板金受損。

所有的冷凝器在裝運前內部皆有充填氣體維持正壓，以避免水氣進入管路內部。在連接管路前由維修閥將氣體釋放，請注意管內部氣體噴出。

所有包裝素材的拋棄必須依照當地廢棄物處理法規辦理。

Lifted by forklift ***以堆高機頂高***



Hoisted by cane ***以吊車吊裝***

3.2 Positioning condenser

In order to reach the best performance of your condenser, you must install the condenser in a correct place. The following general rules must be followed while selecting the position for condenser:

1. Horizontal type condenser must be installed outdoor and there must be no obstacle or eaves on exhaust air side. This condenser is **NOT** designed for installing air duct. If you want to install air duct on exhaust air side, please contact your local agent in advance!
2. In order to get better air flow, please do not place any object under the suction side. And there must be no heat source around the condenser.
3. When install multi-condensers system, do avoid the air flow interference between condensers. There must be at least 1.2 meter space around each condenser. 0.6 meter away from wall.
4. Please avoid the corrosive environment, if it has to be, order anti-corrosion type and clean the condenser more often.

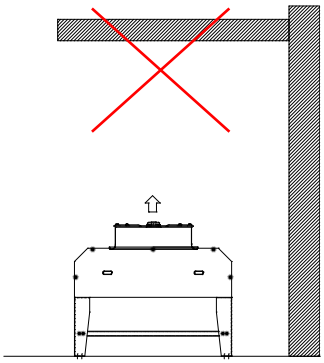
Before installation, check the position with designer or customer to find the most suitable place for the condenser.

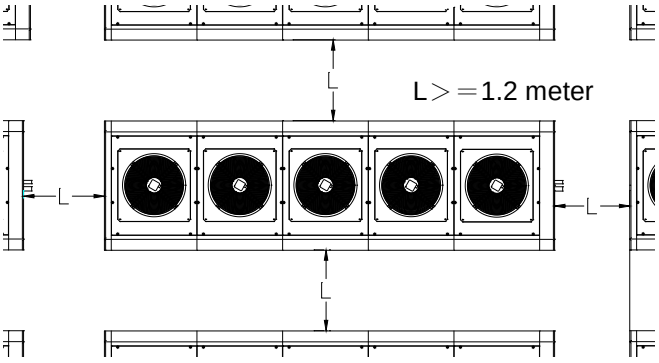
3.2 冷凝器的安裝位置

為了確保冷凝器能發揮最大的效能，必須要將冷凝器裝置在正確的位置。在選擇安裝位置時，必須要遵守以下的通則：

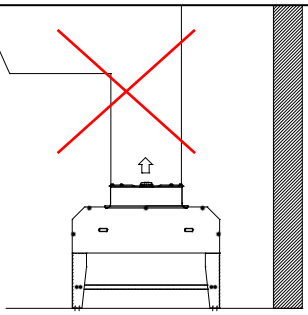
1. 臥式冷凝器必須要安裝於室外，且排風側上方必須要無障物或屋簷。本系列冷凝器**並非**為安裝風管所設計，如果您必須要在排風側安裝風管，請事先與當地經銷商討論。
2. 為獲得較佳的氣流，請勿在吸氣面下方放置任何物件阻擋氣流。且冷凝器四周不可有任何熱源。
3. 在使用多組冷凝器系統時，要注意避免冷凝器之間的氣流互相干擾，每個冷凝器周遭至少要有 1.2 公尺的空間。與牆至少要 0.6 公尺的距離。
4. 請儘可能避開安裝於腐蝕性的環境，如果必須如此，請選購防蝕型機種並經常清洗冷凝器。

在安裝前務必與系統設計者和使用者確認位置，以獲得冷凝器的最佳安裝位置。



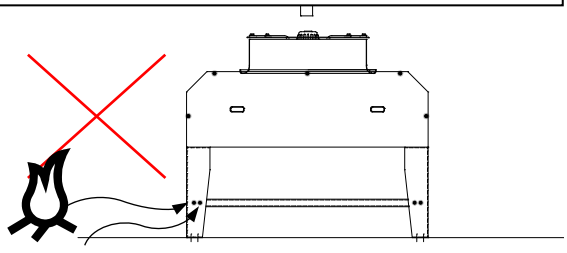


No obstacle or eaves on exhaust air side.
出風側不可有屋簷或障礙物。



No air duct allowed.
禁止裝設風管。

Every condenser should be at least 1.2 meter away from each other and 0.6 meter away from wall.
每一個冷凝器間至少要有 1.2 公尺的距離。與牆少要有 0.6 公尺的距離



Suction side must be away from heat source to avoid capacity being reduced.
冷凝器吸氣端應遠離熱源，避免降低性能。

Caution！
Hoisting working must be executed under local safety regulation!

3.3 Locate

Before working, **MUST CHECK every safety facility** and if hoisting work has to be executed, should follow local regulation abut hoisting.

a. For safety reason, please do anchor the condenser.
b. Diameter of holes for anchoring is 18mm.
c. Lift the condenser to the position, fasten it with nuts.
d. Adjust level to make sure refrigerant will flow as designed.

3.4 Refrigerant Piping

*** Refrigerant piping must be done by professional technician and follow the national codes.**
*** Please follow ASHRAE guide line for refrigerant piping.**
*** The liquid line should not be suddenly expanded in refrigerant direction to avoid flash happening.**
*** Refrigerant line should be as short as possible to reduce pressure drop.**

a. In order to prevent moisture entering condenser, the condenser is sealed with pressurized dry gas. Before brazing the tube, open service valve for exhausting sealed gas. **Be careful for the ejected gas. Take personal safety protecting equipment while working.**
b. When the condenser reaches to the zero pressure status, deburr the tube ends and expand the tube for brazing. For the good cleanness inside the system, use dry nitrogen to purge the oxygen out. This will prevent forming oxide inside during brazing.
c. When finish connecting all the components, perform leak teat and vacuuming. Make sure there is no leak and reach the vacuum level required. It's important for steady system operating.

注意！
吊裝作業必須依照當地安全法規執行！

3.3 定位

在作業前**必須要檢查每一項安全措施**，如需吊裝作業時必須依照當地吊裝作業法規執行。

a. 為安全起見，務必將冷凝器固定於地板上。
b. 固定孔的孔徑為 18 mm。
c. 將冷凝器升高至所要安裝的位置，以螺帽固定。
d. 調整水平確保冷媒可以依設計方向流動。

3.4 冷媒配管

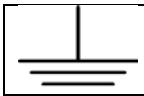
※配管必須符合國家相關法規與系統實際操作需求。並由專業技術人員執行。
※請依照 ASHRAE 手冊的冷媒配管指導原則進行配管。
※配液管時在冷媒的行進方向不可以有突然管徑變大的情形，以免發生閃變。
※冷媒管路盡可能保持短，以降低管路壓損。

a. 為確保冷凝器管路內部保持乾燥，出廠前內部會充填乾燥氣體。焊接前，請小心開啟維修閥，讓冷凝器內部氣體排出。**注意!釋氣時應注意噴出氣體，工作時請穿戴個人安全防護裝備。**
b. 當冷凝器達到零壓力後，開始進行銅管切口去毛邊與擴口準備焊接。為維持管內的潔淨，焊接前請先以氮氣掃除原管內的氧氣，焊接時請以微量氮氣充入管內進行焊接，以避免管內氧化！
c. 當連接完成所有的管路後，進行測漏與抽真空。確認系統無洩漏且達到所需要的真空度。此對於日後系統穩定運轉是十分重要。

3.5 Wiring

Wiring work must be executed by professional technician and follow the related electric codes!

a. Use the correct tool for wiring.
b. Please select the correct electrical wire based on the rating current specified on the connection diagram. (Connection diagram is on the back of terminal box cover.)
c. Connect the fan motor to power source, check if the rotation direction is correct.
d. For safety reason, be sure to ground condenser.



BE SURE TO GROUND CONDENSER!

3.5 電路接線

電路接線工作必須由專業技術人員並依照國家電工相關法規執行！

a. 請使用正確的工具進行接線。
b. 請依照接線圖上所標示的額定運轉電流選擇適當的電線規格。(接線圖位於端子盒蓋背面。)
c. 將馬達與電源接妥，並測試馬達轉向是否正確。
d. 為了安全起見，務必將冷凝器接地。

務必將冷凝器接地！

4. Test running and adjustment

4.1 Before start up

Before setting system into working, the following check list must be examined very carefully:

- ☑ Check fan support(s) is/are fastened firmly. All the screws are fixed. There is no loose part before running.
- ☑ Check the level of condenser is correct.
- ☑ Check all the electric wirings are correctly connected and fastened tightly.
- ☑ Check the power source is correct. And the fan is in right rotation direction.
- ☑ Check the refrigerant piping is connected and all valves are in their positions. System is filled up suitable refrigerant quantity.

4. 試車與調整

4.1 啟動前檢查

在啟動系統之前，請仔細確認以下相關事項：

- ☑ 確認風車支架是否被牢固鎖定，所有的螺絲已被旋緊。運轉前確認無其他鬆動零件。
- ☑ 檢查冷凝器的水平是否正確。.
- ☑ 檢查所有電線是否正確連接且已鎖緊。
- ☑ 檢查供電電源是否正常，確認風扇轉向正確。
- ☑ 確認冷媒管路已連接妥當，所有的閥都在正確的位置。系統已充填適當的冷媒量。

4.2 Check and adjust while running

In order to keep system in steady running, must adjust well in test running, the following check list must be examined and adjusted with patience.

* Check for fans rotating direction, make sure all the fans run in correction direction. Check the current if it is correct.
* Check if there is any short circuit in air side.
* Check oil level, if too low add adequate oil to standard oil level. If system is equipped with high pressure side oil separator, there is no oil return at high temperature but oil returns at low temperature. Do check the capacity of oil separator if it is too small.
* Check if condensing temperature is at the design point. Be sure to consider the outdoor air temperature while checking condensing temperature.
* Check sight glass of liquid line. The liquid must be full at the rating operation.

5. Maintenance

In order to keep condenser in a good condition, you have to check the condenser periodically. The following items must be done for check.

a. Clean the fins periodically for retaining performance. Use clean water to wash fins. Water pressure must be lower than 4 bars. Be careful not to damage the fins, otherwise it will block air flow. Use fin comb to straighten the damaged fin. If needed, use neutral detergent to clean the coil. Must rinse the coil till no residence left.

If condenser is coated with EnergyGuard, please follow instruction of EnergyGuard!

b. Clean fan blades and air streamer fan guard. If fan blades are damaged or bent, replace with new ones.
c. Check every electrical connection is fastened. Also check if there is any current leakage, find out the problem and fix it.
d. Check fan motor if there is any noise. If so, fix it or replace it.
e. Check every screw and bolt, if there is any loose part, fasten it.
f. Check tubes and brazed parts of condenser if there is any stain or spot. If there is any corrosion happened, do remove the aggressive material(s), and check if there is any leak.

4.2 運轉時的檢查與調整

為確保系統能穩定運轉，試車時必須要仔細調校，以下的檢查項目在試車過程中必須要耐心觀察與調整。

*檢查風扇運轉方向，確保所有的風扇向正確。檢查運轉電流。
*檢查空氣是否有短循環。
*檢查油位，如果油位過低加入適量的冷凍油至標準油位。如果系統裝有高壓側油分離器，在高溫段不回油低溫段才回油的情形，請檢查油分離器的能力是否過小。
*檢查冷凝溫度是否在設計點。檢查冷凝溫度時請同時考慮當時的外氣溫度。
*檢查液管的視窗，在額定運轉時視窗必須呈現滿溢情形。

5. 保養

為確保冷凝器維持良好的運轉狀態，請定期檢查並保養冷凝器。

a. 定期清潔鰭片確保熱傳效能的維持。使用清水清潔鰭片，水的壓力必須要低於 4 bar。清潔時要注意不可以損壞鰭片，以免阻擋氣流通道。使用鰭片梳將傾倒的鰭片梳直。必要時使用中性清潔劑清洗盤管，清洗後務必潤洗乾淨至無殘留物留在熱交換器上。

＊＊如果冷凝器已進行衛能防蝕處理，請依照衛能保養說明進行清潔！＊＊

b. 清潔扇葉與導風罩。如果扇葉受損或彎曲請更換新的扇葉。
c. 檢查電氣接點是否鬆脫，鎖緊鬆脫的部分。同時檢查是否有漏電的情形，如有請找出原因並予以修復。
d. 檢查風扇馬達是否有異音，如有請修復或是更換馬達。
e. 檢查所有的螺絲與螺栓，如果有鬆脫的部分請鎖緊。
f. 檢查冷凝器的管路與焊接點是否有銹點與污斑。如果發生鏽蝕情形，請將腐蝕性物質移離，並檢查系統是否洩漏。

*EnergyGuard is a trade mark of Monopoly BV, Holland
*衛能為荷蘭 Monopoly BV 的註冊商標!

6. Trouble shooting

Symptoms	Possible causes	Correction
Condensing temperature is too high	1. Condenser is dirty 2. Supply voltage to fan(s) is too low 3. Heat source nearby or short circuit in air flow 4. Fan is out of order. 5. Condensing temperature control is out of order. 6. Outdoor temperature is too high.	1. Clean condenser. 2. Check the power source. 3. Remove heat source or any obstacle causes short circuit. 4. Replace a new one. 5. Check condensing temperature control and repair it. 6. Check design point.
Condensing temperature is too low	1. Insufficient refrigerant charge/leak 2. No heat load. 3. Condensing temperature control is out of order. 4. Outdoor temperature is too low.	1. Charge refrigerant/repair the leaking. 2. Check the loading and control. 3. Check condensing temperature control and repair it. 4. Check design point and condensing temperature control.
Fan speed is too low	1. Motor is out of order. 2. Incorrect power source.	1. Replace a new one. 2. Check the power source and fix it.
Fan does not run	1. Control component(s) broken. 2. Motor is out of order. 3. Stuck.	1. Check the control circuit, replace the broken component(s). 2. Replace a new one. 3. Remove obstacle(s).
Fan is running but no air out	1. Condenser is dirty	1. Clean condenser.

6. 故障排除

現象	可能原因	處理方法
冷凝溫度過高	1. 冷凝器髒污 2. 風車供應電壓過低 3. 附近有熱源或是風路短循環 4. 風車故障 5. 冷凝溫度控制故障 6. 外氣溫度過高	1. 清潔冷凝器。 2. 檢查供應電壓並予以修正。 3. 移除熱源或是造成風路短循環的障礙物。 4. 更換新的風車。 5. 檢查冷凝控制並予以修復。 6. 檢查設計點。
冷凝溫度過低	1. 冷媒充填量不足／洩漏 2. 無熱負載 3. 冷凝溫度控制故障 4. 外氣溫度過低	1. 補充冷媒量／檢查有無洩漏並予以修復 2. 檢查負載與控制系統 3. 檢查冷凝控制並予以修復。 4. 檢查設計點與冷凝控制。
風扇轉速太慢	1. 馬達故障 2. 供應電源不正確	1. 更換新馬達。 2. 檢查電源並予以修正。
風扇不運轉	1. 控制元件故障 2. 馬達故障 3. 扇葉卡住	1. 檢查控制迴路並更換損壞零件。 2. 更換新馬達。 3. 移除障礙物。
風扇運轉但無風量	1. 冷凝器過髒	1. 清潔冷凝器。

Memo 備忘

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