



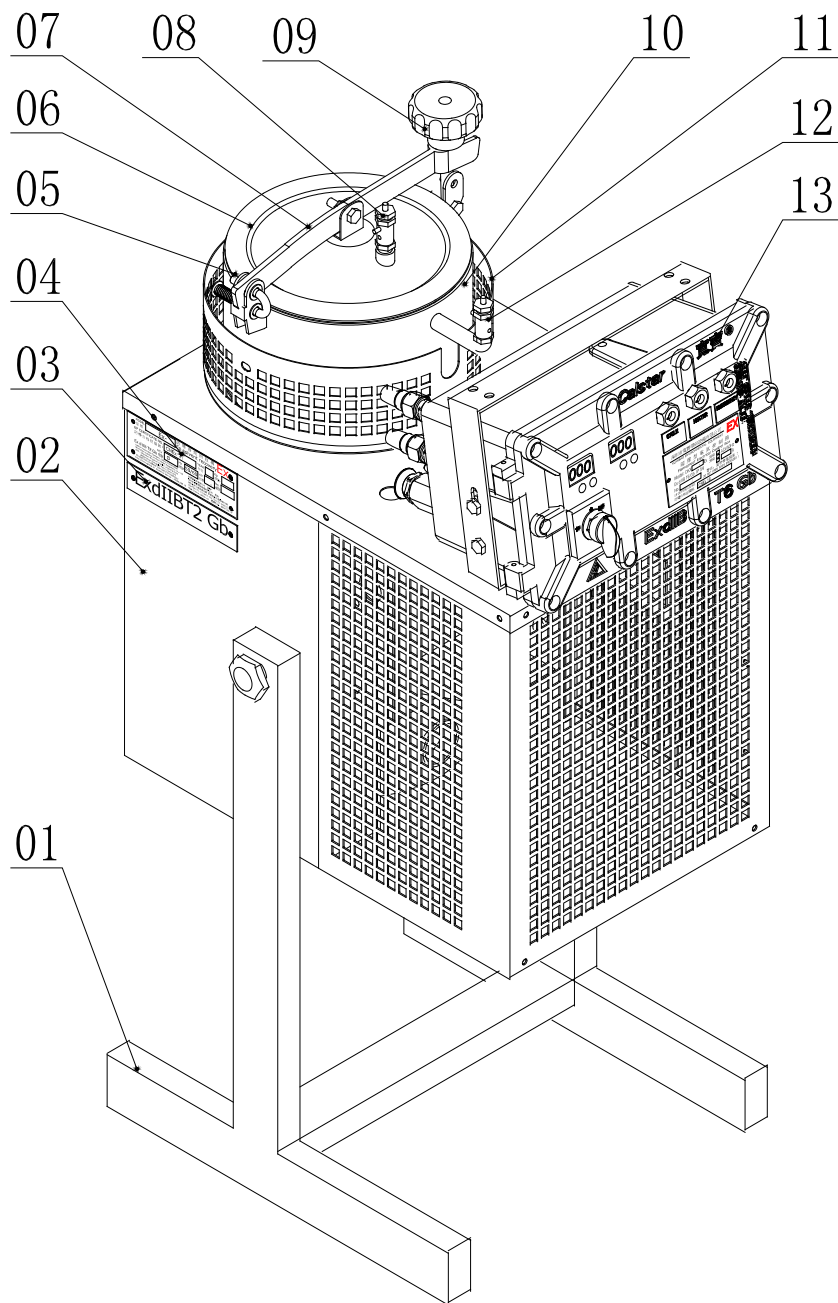
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SOLVENT RECOVERY MACHINE

OPERATION AND MAINTENANCE HANDBOOK

Calstar A10Ex

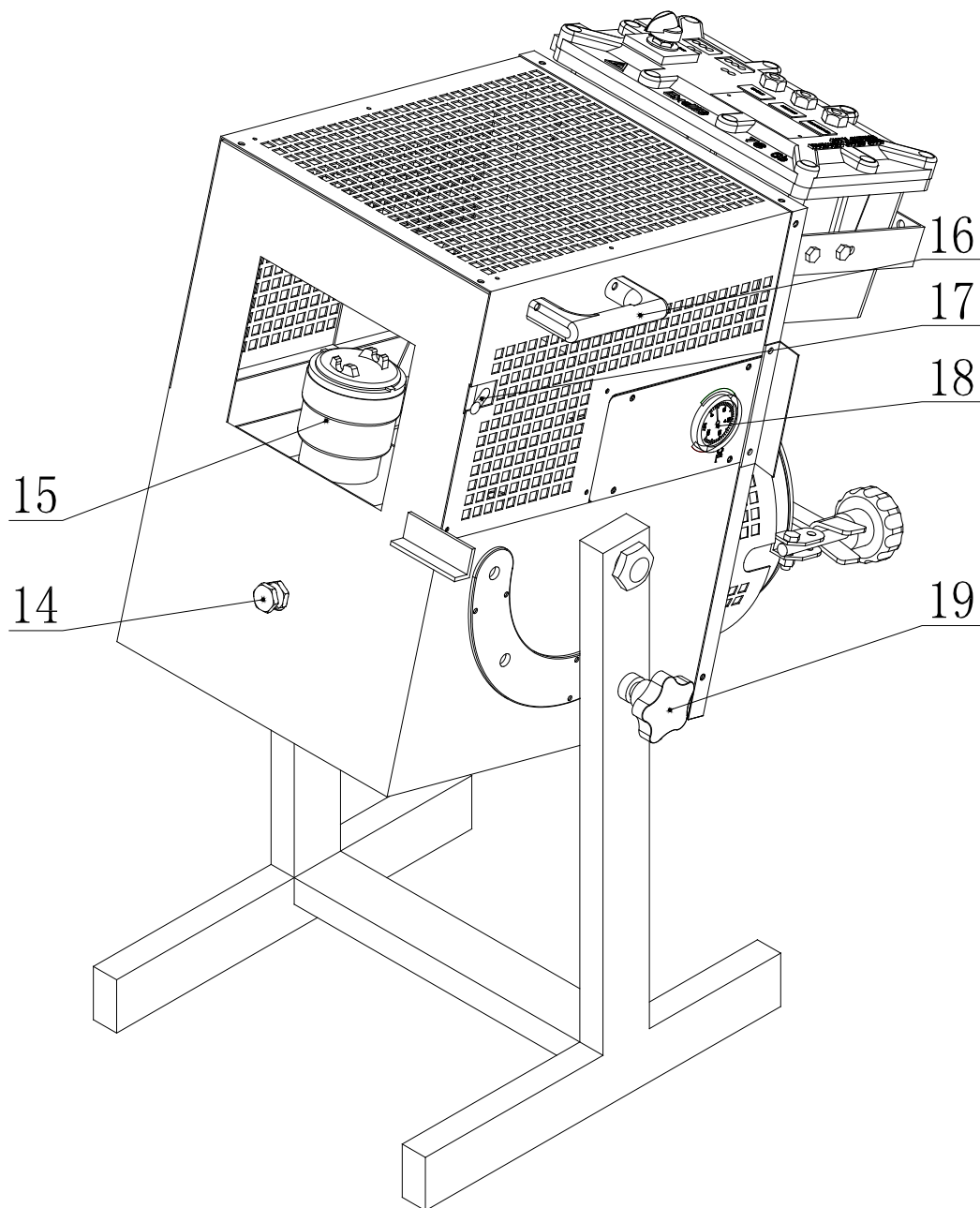
A10Ex Parts Description



- | | | |
|---------------------|-------------------------------|------------------|
| 01 机架 Frame | 02 机箱 shell | 03 防爆标志牌 Ex. Tag |
| 04 机器铭牌 machine tag | 05 横梁活销 shotpin of tank cover | |
| 06 桶盖 tank cover | 07 桶盖横梁 beam of tank cover | |
| 08 安全阀 safety valve | 09 桶盖锁紧手柄 locking structure | |
| 10 桶槽 tank | 11 桶护圈 heat isolation rail | |

12 泄气阀venting valve

13 电控箱electrical box



14 放油密封螺母sealed screw of exhaust heat transfer oil

15 防爆加热器Ex. heater

16 提手handle

17 干净溶剂出口outlet of recovered solvent

18 蒸汽温度表steam temp. meter

19 安全锁止销shotpin

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0.0 機器標牌上符號之意義 (SYMBOLLOGY)

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代表不要用水去滅火。
 (**No Water** apply to the fire)



代表嚴禁吸煙及任何煙火靠近此機器。
 (**No Smoking**. Any Fire is prohibited)



代表此部品零件處於高溫狀態，請勿觸摸。
 (**Don't Touch**. High-Temperature Area)



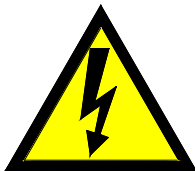
代表使用此機器時，必須使用防護眼鏡。
 (**Using Glasses** during the job)



代表使用此機器時，必須使用防毒面罩。
 (**Using Gas mask** during the job)



代表使用此機器時，必須使用防護手套。
 (**Using Gloves** during the job)



代表電路板有高壓電源，請勿觸摸以免觸電。
 (**Don't Touch**, high voltage electricity)

1.0 概說 (GENERAL CONCEPT)

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A10Ex 系列防爆溶劑回收機（以下簡稱回收機） 防爆性能按照 GB 3836.1—2010《爆炸性環境 第1部分：設備 通用要求》及GB 3836.2—2010《爆炸性環境 第2部分：由隔爆外殼“d”保護的設備》的要求製成隔爆型結構；防爆標誌為**Ex d IIB T2 Gb**，適用石油，化工，輕紡，醫藥工廠II A～II B級，T1～T2 組爆炸危險場所1區、2區作為環保設備使用。回收機作為中小型環保設備用於各種可燃性溶劑與不燃性溶劑回收再生。

該產品具有極高性能價格比，現場占地小，操作簡單方便，可以極大的提高使用溶劑安全性與便利性。具備超載保護，短路保護，超時保護，超壓保護，超溫保護，**防爆保護等完善保護功能。**

回收機主要防爆部件有防爆軸流風機、防爆電加熱器、隔爆型電氣控制箱。

(A10Ex serious Anti-Explosion Solvent Recovery Manipulator (called Solvent Recovery Manipulator) are designed in accordance with the government regulation GB 3836.1-2010 <Explosive atmospheres- Part 1: Equipment-General requirements and GB3836.2-2010 < Explosive atmospheres- Part 2: Equipment protection by flameproof enclosures “d”>. The sign of anti-explosion is Ex d IIB T2 Gb. This equipment may be applied in the industries of petroleum, chemical engineering, textile, medical supplies IIA~IIB, any risk of explosion area I, area II, T1~T2. The Solvent Recovery Manipulators may be used as the small/medium environmental protection equipment to reclaim the inflammable or non-inflammable solvent.

The advantages of the equipment are: inexpensive price, small space requirement, easy operation, eliminate solvent consumption. The self-protections of this equipment are: Overload Protection System, Emergency Shutoff Protection System, Over Timing Protection System, Over Pressure Protection System, Over Heat Protection System.

The components of anti-explosion are: Anti-Explosion Axle Fan, Anti-Explosion Heater and Anti-Explosion Electrical Control Box.)

1.1 防爆軸流風機 (Anti-Explosion Axial Flow Fan)

用於防爆溶劑回收機蒸氣冷凝器通風冷卻。該產品選用小型方形罩極電機製成隔爆型結構，防爆標誌**Ex d IIB T5 Gb**。隔爆結構設計符合GB3836.1-2010、GB3836.2-2010的要求，外殼材質為鑄造鋁合金，電纜引入裝置符合GB3836.1-2010“Ex電纜引入裝置”要求。

適用工廠II A～IIB級，T1～T5 (**Ex d IIB T5 Gb**) 爆炸危險場所1區、2區作為小型防爆軸流風機用。該產品具有運轉效率高，壽命長，運行溫度範圍寬，超載熱保護功能。

This fan is used in evaporator cooling system. It contains small square electrical construction with label “**Ex d IIB T5 Gb**”. This component matches the government requirement GB3836.1-2010 and GB3836.2-2010. The raw material and electric cable match the government requirement GB3836.1-2010 <Ex cable In plant>.

This component can be used in the industrial zone code IIA~IIB, T1~T5 (**Ex d IIB T5 Gb**), Explosive Warning Zone 1 and Zone 2. This fan comes with the special benefit of long period operation, wide temperature range and over heat protection system.)

1.2 防爆電加熱器 (Anti-Explosion Heater)

用於回收桶熱煤油加熱。該產品選用優質不銹鋼加熱器與鑄鋁防爆接線盒製成隔爆型結構，防爆標誌**ExdIIBT3**或**ExdIIBT4**。隔爆結構設計符合GB3836.1-2010、GB3836.2-2010的要求，外殼材質為鑄造鋁合金，電纜引入裝置符合GB3836.1-2010“Ex電纜引入裝置”要求。加熱管的發熱部分應全部浸入介質中，不得漏出熱煤油液面。並設置有溫度測定及高溫保護裝置。

同時，該產品適用工廠II A～IIB級，T1～T2 (**Ex d IIB T2 Gb**) 組爆炸危險場所1區、2

1.4.1.2基本參數 (Basic parameters)

額定電壓(Applied Voltage) : AC110V

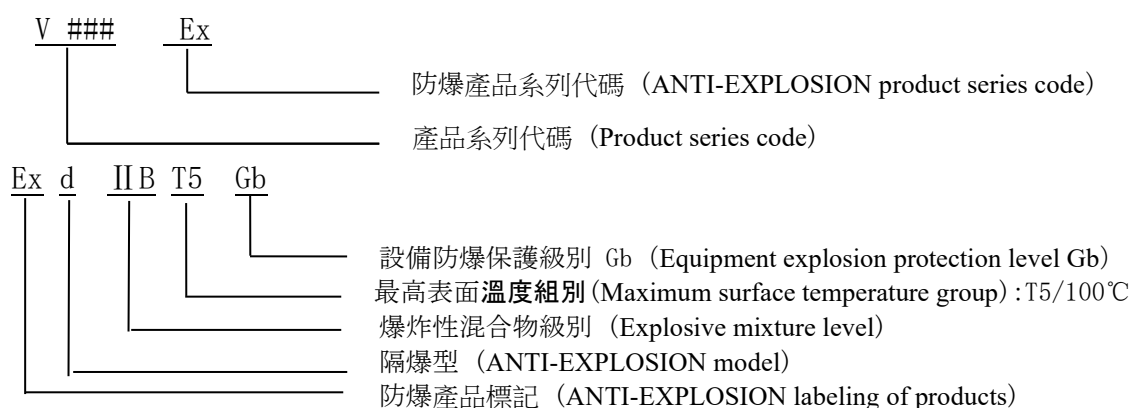
額定頻率(Applied Frequency) : 50/60Hz

額定功率(Applied Currency) : 2.2 kW

1.4.2 防爆軸流風機 (Anti-explosion axial flow fan)

(水冷式無此結構Water-cooled absence of structure)

1.4.2.1型號及防爆標誌含義 (Model and explanation of the anti-explosion sign)



1.4.2.2基本參數 (Basic parameters)

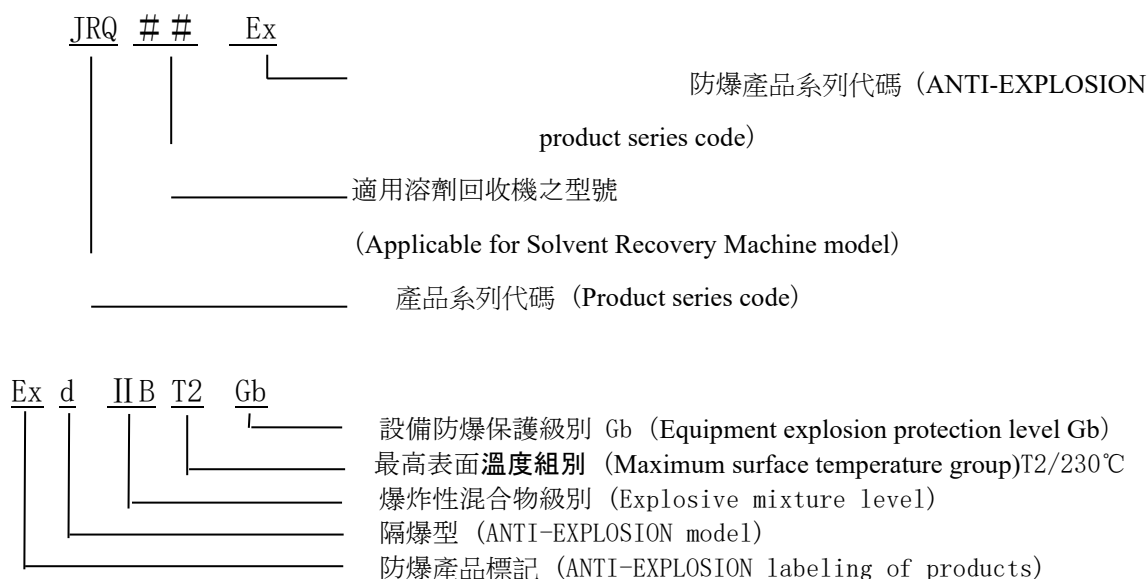
額定電壓(Applied Voltage) : AC110V

額定頻率(Applied Frequency) : 50/60Hz

額定功率(Applied Currency) : V300Ex: 90W/100V

1.4.3防爆加熱器 (Anti-explosion heater)

1.4.3.1型號及防爆標誌含義 (Model and explanation of the anti-explosion sign)



1.4.3.2 基本參數 (Basic parameters)

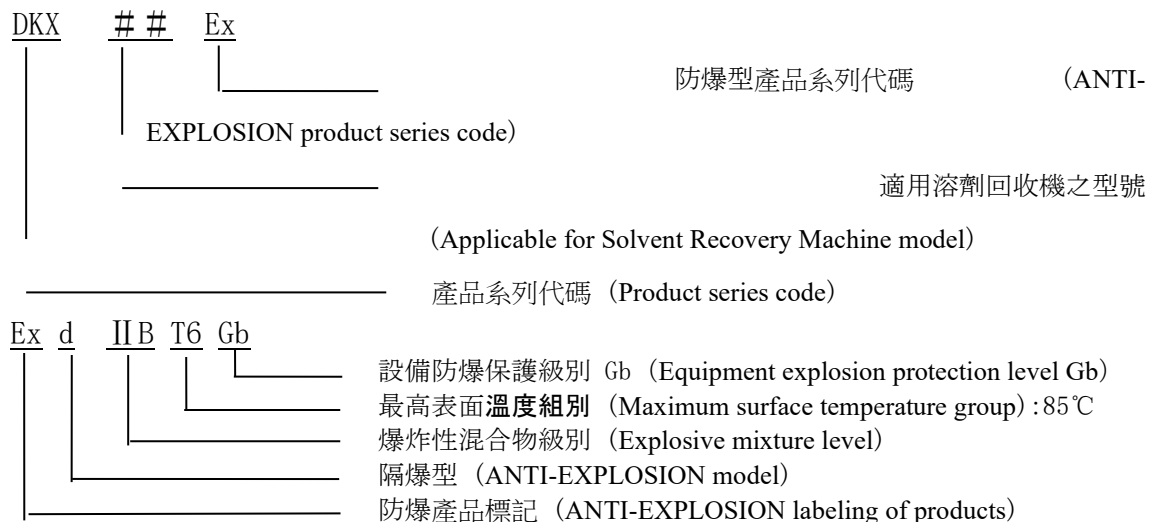
額定電壓 (Applied Voltage) : AC110V

額定頻率 (Applied Frequency) : 50/60Hz

額定功率 (Applied Currency) : JRQ20Ex : 3.0 kW ; JRQ30Ex : 4.0 kW ; JRQ60Ex : 5.0 kW ;
JRQ200Ex : 6.0 kW

1.4.4 隔爆型電氣控制箱 (Anti-explosion electrical control box)

1.4.4.1 型號及防爆標誌含義 (Model and explanation of the anti-explosion sign)



1.4.4.2 基本參數 (Basic parameters)

額定電壓 (Applied Voltage) : AC110V

額定頻率 (Applied Frequency) : 50/60Hz

額定電流 (Applied Currency) : DKX60Ex : 32A

1.5 工作環境要求 (Working environment requirements)

1.5.1 海拔不超過2000 m。 (Sea-level altitude does not exceed 2000 m.)

1.5.2 環境溫度 -20℃~+40℃, 無陽光直射。 (The ambient temperature is between -20℃~+40℃, and without direct sunlight.)

1.5.3 周圍空氣相對濕度不大於95% (+25℃時)。 (The ambient relative humidity is no more than 95% (Room temperature +25℃).)

1.5.4 周圍無顯著搖動與衝擊震動。 (No shaking or unstable environment or location.)

1.5.5 無明顯破壞絕緣氣體或蒸氣環境。 (No significant environmental gas or steam damage insulation.)

1.5.6 無滴水與其他液體侵入的地方。 (No water leakages or place for other liquid.)

1.5.7 寬敞通風, 周圍無任何煙火與高溫物體。 (Spacious ventilation, without any high temperature objects or pyrotechnics around.)

2.0 機器用途 (APPLICATION)

回收機是以蒸餾的物理方式將使用過的廢溶劑回收再生, 以便達到重複使用之目的。

請依照本《操作及保養說明書》(以下簡稱《說明書》)之說明指示來使用及保養機器。在使用

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溶劑及相關之廢棄物時,請依照《說明書》之保護事項及注意事項的要求,同時請務必與原料供應廠商確定所使用溶劑之相關技術資料。

- 一般情形,蒸餾回收可重複操作。
- 用戶使用設備前必須仔細閱讀本《說明書》; 嚴禁帶電拆裝任何隔爆零部件!
- 隔爆零部件如有損壞需維修更換時, 必須向原製造單位更換, 嚴禁擅自配置更換。
- 檢修後組裝時, 緊固螺釘與螺栓必須擰到位, 固定緊。
- 任何違反本《說明書》之操作必須視為不當及不合理操作。
- 製造廠商對於任何不當,錯誤及不合理之操作所產生後果不負責。

(The Solvent Recovery Machine serves the purpose to recover the polluted solvents that through the distillation process can be reused.

The use and the maintenance of the Solvent Recovery Machine must always be arranged only following the instructions in this handbook. The protections and precautions required during the solvents and relative pollutants use. Should the solvents and the relative pollutants be followed by technical notes and/or safety characteristics for their use stated by the supplier, it is necessary to observe them strictly.

- Normally, the distillation operation can be repeated several times.
- Before using the equipment, please read the Operating and Maintenance Handbook thoroughly; do not disassemble any unit parts while under electrical feeding!
- If any parts are damaged and need repairing, please contact the manufacturer for replacements. The unauthorized replacement is prohibited.
- After overhauling and when assembling, secure the screws and bolts to their according places and fixed tight.
- Any use of the Solvent Recovery Machine different from the one stated in the present handbook will be considered improper and unreasonable.
- The manufacturer is not responsible for the improper, wrong and unreasonable uses.)

3.0 安全保護功能 (SECURITIES)

本機器對操作人員及可能會接觸到機器之人員提供了一系列安全及保護措施

(Our machine offer securities and protecting the operator or other eventual persons who may come into contact with the Solvent Recovery Machine.)

主要安全保護功能如下述 (The main securities existing on the unit are the following) :

3.1 停電之保護 (Protection against electrical output cutoff)

在使用過程中如果出現短暫的停電情況,本機器能夠自動關機.當再次供電時,電源指示燈會亮.若想重新啟動機器,必須啟動開關,扳至標示“OFF”,“ON”,“START”之“START”位置,機器才能重新工作。

(In case of an electrical output cutoff, even for a few seconds, the Solvent Recovery Machine automatically goes to cycle end. When the electric current returns the emergency, light will turn on. Despite the presence of tension, the unit will not start working again. It has to be set at work again through the procedures of cycle start. Restart the unit by turning the switch on to “START.”)

3.2 超溫之保護 (Emergency thermostat shut off)

當熱媒油溫度超過高溫保護溫度控制器之溫度設定值時, 機器會執行下述功能 (When

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the Heat Transfer Oil temperature exceeds the emergency thermostat at the fixed setting, the unit actuates the following functions) :

- 高溫保護紅燈會亮 (the emergency light switches will be on)
- 加熱器會停止加熱 (the distillation cycle will stop)
- 電風扇會繼續運轉降溫，直至機器自動關極 (the electro-blowing-fan will continue to operate, therefore decreasing the temperature, until the unit turns off automatically)

3.3 超壓之保護 (Security valve for overpressure)

當桶內溶劑蒸汽壓力超過安全閥所設定壓力時，安全閥會自動開啟泄壓。

(When the tank's solvent steam pressure exceeds the set safety pressure, this device intercepts the pressure of 0.3 Bar and then opens, allowing the ventilation of the excess steam.)

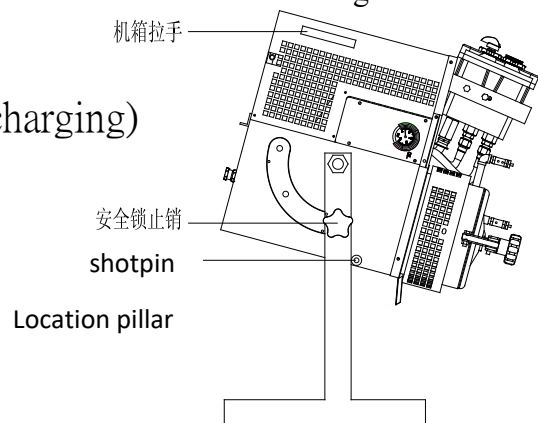
3.4 定時關機功能 (Timer function)

定時關機功能為機器之安全保護系統，當回收機在超出正常回收時間仍沒有自動關機時，則時間控制器會自動停止加熱器加熱，電風扇會繼續運轉降溫，直到機器自動關機停止工作；同時有指示燈顯示機器當前工作狀態。此外，時間控制器亦可實現依據客戶需要自行設定回收機工作時間並自動關機。

(The timer function can achieve safety and security. When the unit does not automatically turn off while exceeding the normal recovery time, the timer will automatically stop the distillation cycle, the electro-blowing-fan will continue to operate, bringing down the temperature until the unit automatically turns off. At the same time, the light handle indicate the current status of work. In addition, based on the client's needs, the timer can control the working time of the Solvent Recovery Machine.)


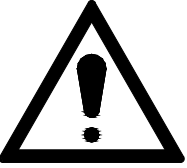

3.5 安全傾倒系統(Tilting system for discharging)

安全傾倒系統為回收機在清理殘渣時的安全鎖止機構，操作簡單、方便，如圖所示。向外拉出安全鎖止銷並抓緊機箱拉手使機箱緩緩傾倒，旋轉至預定位置後定位柱與机架完全接觸，由於支撐杆的作用，機箱便停留在該位置。清渣或更換熱媒油操作結束後，使機箱恢復至初始水平位置即可，此時安全鎖止銷自動鎖止機箱在水平位置固定。



(Tilting system is a locking structure for safety when Discharging residual. Simply operation as the right pic shown. Pulling out safety shotpin, hold tightly the handle on the machine, slowly tilting till the location pillar touching the frame of machine. Then push the shotpin in to lock the location for discharging residual or replacing Heat transfer oil. To reset the machine to its initial position after discharging residual, and to lock shotpin.)

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	<p>進行回收時，嚴禁傾倒機箱！回收後傾倒機箱前，應當旋緊泄氣閥以免導致熱媒油的外泄。</p> <p>Do not overturn the tank before the cycle ends. Before pouring the collected tank, make sure to screw up the air release valves to avoid Heat Transfer Oil leakage.</p>
	<p>不要移開或修改任何回收機之零件，尤其是保護網路！！</p> <p>Do not remove or modify any parts of the Solvent Recovery Machine. Especially, the protection network!!</p>
	<p>請在完全瞭解溶劑及相關廢棄物之組成後再執行回收蒸餾，否則不要執行回收蒸餾並與Calstar公司或最近之代理商聯繫。</p> <p>Carry out the distillation only after understand the composition of the solvent. Otherwise, please contact Calstar or the nearest authorized branch office.</p>

4.0 主要零件之材質說明 (DESCRIPTION OF MAIN COMPONENTS' MATERIAL)

- ✧ 防爆電控箱，防爆電加熱器，防爆風機的防爆外殼為鑄造**鋁合金** (The ANTI-EXPLOSION surface frame of the control box, heater, and the air-compressors are made of aluminum alloy)
- ✧ 回收桶及桶蓋為SS304不銹鋼製。 (The tank and the tank lid are made of SS304 Stainless Steel)
- ✧ 桶蓋墊圈為**鐵氟龍** (The lid seal is made of PTFE)
- ✧ 冷凝器導管為紫銅管 (The condenser ducts are made of copper)
- ✧ 溶劑出水管為耐溶劑類特殊膠管 (The outlet pipe for distilled solvents is made of a special solvents resistant plastic material)

針對上述零件之材料特性，使用者必須查對溶劑及殘渣與零件之相容性。 (The user must verify the compatibility of the solvents that to be recovered.)

- 氯化物溶劑最好使用不銹鋼冷凝器， (For chlorinated solvents it is advisable to use stainless steel condensers.)
- 高沸點溶劑最好配用真空泵減壓裝置。 (For high-boiling solvents it is advisable to use vacuum pumps.)
- 低沸點**氟里昂**溶劑最好配用專用冷凝器裝置。 (For low high-boiling gas solvents it is advisable to use dedicated condenser devices.)



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	<p>在操作及保養中，嚴禁吸煙或接近煙火！！</p> <p>During all the operations, including the maintenance, do not smoke and do not approach with fires!!</p>
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在使用及保養回收機時，尤其是在進料廢溶劑及清除殘渣時，請務必戴上

(During the use and the maintenance of the Solvent Recovery Machine. Especially in the filling phase of the exhausted solvents and in the discharge phase of the distillation residues, it is necessary to wear):

- 防護手套 (Working gloves)
- 防護眼鏡 (Protection glasses)
- 防毒面罩 (Gas mask)
- 其他當地法令法規所規定之勞動保護用品 (Other protective equipment required by local laws)

5.0 注意事項 (NOTICE)

5.1 操作不當會冒煙 (It may come to smoke from wrong operation)

該機器是採取熱媒油間接加熱方式回收溶劑，回收過程均勻穩定。由於溶劑回收桶槽封閉，且各部件為防爆設計，因此機器在正常操作下非常安全，不會有危險。(The unit recovers solvent by indirect heating of Heat Transfer Oil. The recovery process is stable. Since the recovery tank is securely enclosed and all components of the unit are designed as ANTI-EXPLOSION, the unit is very safe during normal operation. Therefore, it will be operated without serious risk.)

但如果操作中未能按照本說明書指示正確操作保養機器，則可能會造成機器回收時，殘渣過熱而冒煙。(However, if the operator fails to follow the instructions as indicated by the **Operation and Maintenance Handbook** during operation, the Solvent Recovery Machine may cause **residues to overheat and emit smoke!!**)



主要原因如下 (The main reasons are as followed):

- 機器回收桶內殘渣清理不徹底，殘渣越積越厚，在高溫加熱狀態下，造成殘渣板結碳化，致使回收機回收效率嚴重降低，自動關機時間延長，造成殘渣過熱冒煙。(If the residues within the Solvent Recovery Machine are not thoroughly cleaned, the residues will accumulate. Upon high temperature heating, the residues will carbonate and harden, resulting in the deterioration of the recovery efficiency, prolongation of the automatic-cut-off time, and causing residues to overheat and emit smoke.)
- 溫度控制器設定錯誤。例如：丙酮沸點56°C，若關機溫度控制器之設定高出或太接近56°C，機器將無法自動關機，持續加熱，引起殘渣過熱冒煙；熱媒油加熱溫度設定太高也會造成殘渣過熱冒煙。(Incorrect setting of the thermostats. For example: the boiling point of acetone is 56°C. If the automatic-cut-off thermostat temperature is set too close to 56°C or any higher, the unit cannot automatically turn off and continue heating. This will cause the residues to overheat and emit smoke. If the Heat Transfer Oil heating temperature is set too high, it will also cause the residues to overheat and smoke.)
- 進料太多（超出最高液位線）或廢液本身太黏稠會發泡造成管路阻塞，因而蒸汽外泄，

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請將廢液靜置澄清後再回收或減少進料容量回收。(If the solvent tank is overfilled (exceeding the maximum level marked in its inside), Residue is too thick, or foaming will obstruct the condensing coil and causing steam leakages. Please appropriately reduce the input capacity or clean out the residue.)

- 墊圈與回收桶接觸處未清理乾淨，造成蒸汽外泄，若蒸汽周圍有熱源都可能造成冒煙。
(If the area between the tank and the lid seal is not cleaned, steam leakages may occur. Additionally, if there are heat source around the steam, it may cause smoke.)
- ◆ 機器冒煙後，只要不打開桶蓋，不會起火產生危險。(When the unit emits smoke, as long as the tank cover isn't opened, there will be no risk of igniting a fire.)
- ◆ 注意事項 (Attention):
 - ☆ 機器冒煙時，請關閉總電源，待機12小時冷卻後，再清理機器，如機器未全部冷卻而打開桶蓋會引起起火危險。(When the unit emits smoke, please cut out all electricity feeding of the Solvent Recovery Machine. After 12 hours of cooling, thoroughly clean the tank. If the unit is not fully cool down, opening the tank lid will ignite a fire!)
 - ☆ 操作現場通風散熱良好，附近嚴禁火源，電源總開關設在室外或離機器在2米以上的地方。(Working environment should have correct ventilation and efficient cooling; do not approach the unit with free fires; main electricity switch should be set outside of the building or placed at least 2 meters from the unit.)
 - ☆ 每次回收完畢請將回收桶內殘渣徹底清理乾淨。(Thoroughly clean the tank after each solvent recovery cycle.)
 - ☆ 墊圈損壞及其它原因造成蒸汽外泄，請聯絡供應廠商修理。(If the lid seal is damaged or other reason causes steam leakages, please contact the manufacturer or its local office immediately.)

	在操作回收之前，需對被回收廢溶劑之物理化學特性有足夠瞭解。 Carry out the distillation only if the composition of the solvent and of its relative pollutant is perfectly known.
	在操作及保養中，嚴禁吸煙或接近煙火!!! During all the operations, including the maintenance, do not smoke and do not approach with free fires!!

5.2 化學風險:化學反應 (Chemical risks: Chemical reaction)

在下列情況下，可能會發生化學反應 (Chemical reactions can happen in the following cases):

- 在儲存時，溶劑之品質降級劣化，尤其是產生過氧化物的酮類物質。(Degradation of solvents

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during the storage; in particular formation of peroxides with some oxygenated compounds and some ketones.)


- 回收過程中，溶劑之品質降級劣化。(Degradation of solvents during the solvent recovery treatment.)
- 在溫度影響下，造成硝酸鹽類物質劣化(如：硝酸甲烷)。(Degradation of nitrate compounds under temperature effect (ex. nitromethane).)
- 由於缺乏安定劑產生腐蝕性物質(如：鹽酸)。(Formation of corrosive compounds determined by the lack of stabilizer (ex. hydrochloric acid).)
- 特性殘渣之分解(如：硝化纖維素)。(Decomposition of certain residues (ex. nitrocellulose).)
- 混合不相容之物質在一起(如添加氧化劑：硝酸加入可燃性混合物裏)。(Mixtures of incompatible products (presence of a strong oxidizer, such as nitric acid, in a mixture of flammable products).)

5.3 化學風險：刺激性、毒性 (Chemical risks: irritation, poisoning)

接觸溶劑液體或暴露在溶劑蒸汽中，可能會刺激皮膚及眼睛；另外，吸入過量溶劑蒸汽至肺中，可能會造成眩暈甚至中毒。

(The contact with the liquids or the exposition to the steams can damage your skin or eyes. Whereas the inhalation of solvent steams will cause toxic risks.)

6.0 綜合注意事項 (GENERAL WARNINGS)

	<p>在回收操作過程中，無論任何情形切勿打開桶蓋!!! Do NOT, for any reason, open the lid during the working phases!!</p>
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- 在回收操作過程中，如果設定加熱溫度過高，某些類殘渣在蒸餾將要結束後，可能會過熱而冒煙(如含硝化纖維素之硝基油漆殘渣)；此時，請不要驚慌，關掉電源，讓機器自行冷卻即可；亦可外力吹風或灑水幫助降溫。嚴禁打開回收桶上蓋!!由於殘渣過熱，打開桶蓋將有大量氧氣進入回收桶極易發生起火!! (During the working procedure, if the distillation temperature is set too high, some types of residues will overheat and emit smoke (for example: nitrogen cellulose from nitro-painting residues). When this happens, please remain calm, cut out the electrical feeding of the unit, and let the unit cool down. External forces fanning or sprinkling water can help lower the temperature. However, do NOT open the tank lid!! Due to overheated residues. Opening the lid will allow large amounts of oxygen into the tank, running a high-risk of fire!!)
- 溫度控制器設定錯誤會造成殘渣過熱而冒煙，如：丙酮沸點56°C，若關機溫度控制器之設定高出或太接近56°C，機器將無法自動關機，持續加熱，引起殘渣過熱冒煙；熱媒油加熱溫度設定太高也會造成殘渣過熱冒煙。(Incorrect setting of the thermostats may result into overheating residues and emission of smoke. For example: the boiling point of acetone is 56°C. If the automatic-cut-off thermostat temperature is set too close to 56°C or any higher, the unit cannot automatically turn off. The unit will continue heating, causing the residues to overheat and emit smoke. If the Heat Transfer Oil heating temperature is set too high, it will also cause the residues to overheat and emit smoke.)
- 不要將不同操作過程產生之廢溶劑倒入桶內一起回收。(In the unit tank, do not combine products from different working cycles.)
- 不要將回收桶作溶劑儲存桶。要開始蒸餾回收溶劑之前，才將溶劑加入回收桶。(Do not use the tank as solvents storage. Fill the tank just before starting the distillation cycle.)

- 為了避免操作過程中蒸汽洩漏,請將桶蓋上緊.如發現有蒸汽洩漏,應立即關機並按“21.0”進行檢查。(Screw the lid knob tightly to avoid steam leakages during the working process. If you find any steam leakages, turn the unit off immediately and act according to the "Operation & Handbook 21.0".)
- 在操作過程中,請勿接觸高溫部位.在未確定回收已確實完畢之前,請勿傾倒回收桶。(Do not touch the hot parts during the operation. Do not overturn the tank before the cycle ends.)
- 回收機在操作過程中不需要任何輔助,但是應該在執行回收結束並關掉電源後,人員方可全部離開。(The Solvent Recovery Machine does not need assistance during the operation. Do Not leave the unit until the end of the working cycle and when the unit power is turned off.)



請依據製造廠商之指示說明,小心的打開桶蓋.

Following the instructions given by the manufacturer. Always open the lid carefully.

6.1 打開桶蓋及殘渣的清除 (Lid opening and residuals discharge)

6.1.1 注意溶劑蒸汽 (Pay attention to solvent steams)

為了避免洩漏危險性之溶劑蒸汽,在蒸汽溫度錶顯示之度尚未低於被回收溶劑之沸點時,請勿打開桶蓋.

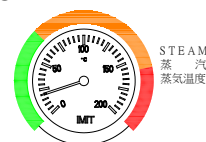
(In order to avoid dangerous emissions of steams, it is necessary not to open the lid when the steam thermometer temperature is lower than the boiling point of the treated product.)

6.1.2 注意殘渣溫度 (Pay attention to the temperature of the residue)

殘渣之溫度與熱媒油溫度很接近,其溫度可由熱媒油溫度錶讀取.每次打開桶蓋清除殘渣時,請檢查熱媒油的溫度.如果殘渣的溫度很高,請小心處理,以免燙傷.

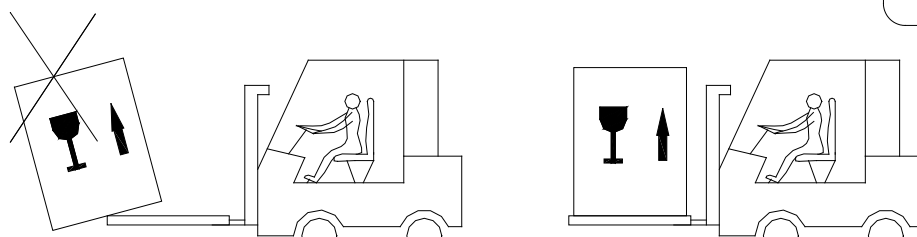
(The residue temperature is always similar to the Heat Transfer Oil temperature. The Heat Transfer Oil temperature is readable on the thermometer. Always check the Heat Transfer Oil temperature before opening the lid and making the discharge. Open the lid and discharge carefully according to the residual temperature.)

附溫度錶標牌圖如上 (Reference to the above picture of the thermometer)



7.0 包裝及運輸 (PACKING AND TRANSPORT)

本機器以螺絲固定在棧板上再封箱包裝,請以堆高機或拖板車搬運,以免機器受損.如左圖所示 (The unit is packed after fixing it on a wooden pallet. The wooden box need to be handled with fork-lift. To prevent any serious damages upon the unit, lift only in the spaces foreseen for this purpose, as pictures below):



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錯誤方式

正確方式

8.0 開箱 (UNPACKING)

開箱之步驟如下 (For unpacking the unit, follow the steps) :

- 打開木箱之上蓋 . (Take the wood case lid away)
- 撬開木箱與棧板連接之處 . (Separate the wood case bottom from the side walls)
- 將木箱往上拿走 . (Take off upwards the wood case side walls)
- 松掉固定在棧板上之螺絲 . (Unscrew the screws that fix the unit on the support pallet)
- 本機器將顯示原來的風貌，並不需要任何準備及處理 . (Then the unit appears in its definitive configuration and does not need any further preparatory treatment)

9.0 安裝 (INSTALLATION)

本機器必需安裝在開放、通風及視線良好之地方，通風可以是外力或自然方式 . (The unit must be installed in an open place, or in any case in a well-ventilated and well-lighted place.

The ventilation of the place can be natural)

- 機器的四面必需距離牆壁50公分以上，以確保通風及散熱效果 . (It is necessary that every side of the unit is at least 50cm away from the wall in order to allow efficient ventilation and cooling.)
- 最好將機器安裝在能負荷此機器重量的瓷磚或水泥地板上 . (Locate the unit on a flat floor to support the declared weight of the unit and its maximum load, tiled or cemented, if possible.)
- 電源之裝備必須按照當地有關溶劑回收之規定來安裝 . (The electrical outlet place must matches the local regulation regarding to the "Settlement of the solvent recovery manipulator treatment".)
- 回收機、控制箱、風機、加熱器安裝前須進行下列檢查，若不符合要求，不允許使用。(The Solvent Recovery machine, control box, axial flow fan, and the heater must be inspected before machine installed. The unit is not allowed to operate if it does not meet the requirements.)
 - a. 回收機、控制箱、風機、加熱器有無防爆合格證編號 ; (Whether The Solvent Recovery Machine, control box, axial flow fan, and the heater have anti-explosion certificate;)
 - b. 回收機、控制箱、風機、加熱器防爆標誌是否符合爆炸性氣體混合物環境使用 ; (Whether the Solvent Recovery Machine , control box, axial flow fan, and the heater have an anti-explosion sign which indicates for explosive mixtures environment use;)
 - c. 回收機、控制箱、風機、加熱器所有防爆零件無裂紋和無影響防爆性能的缺陷; (Whether The Solvent Recovery Machine , control box, axial flow fan, and the heater have no cracks or damages parts which may causes the deterioration of the explosion-resistance performance;)
 - d. 控制箱、風機、加熱器電纜引入裝置正確選用電纜，進入防爆腔的電纜直徑與密封圈的孔徑相匹配，根據密封圈端面標記選擇最小電纜外徑，保證旋緊壓緊螺母後，使密封圈與電纜間及密封圈與引入裝置體之間間隙符合防爆要求。（Whether the cables for the control box, axial flow fan, and the heater are connected to the correct choice of cable installation.)

9.1 固定機器 (Unit set up on the floor)


為了工作上之安全起見，本機器必須以螺絲固定在地板上 . 為此，請使用機架上四個螺絲孔

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及M6之金屬膨脹型螺絲固定。

(For a safe working, the unit must be fastened to the floor by screw anchors. For this purpose, use the four holes on the unit feet. The screw anchors must be of expansion metallic type with metric M6 screws.)

10.0 組裝(SETTING AT WORK)

	<p>每次只要有關於電力方面之操作，縱然很簡單，還是需要專門技術電工來執行。</p> <p>Even the operation of the electrical panel is easy, it still requires the labor of professional workers.</p>
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10.1 接電 (Electrical connection)

本機器除需接電之外，不需要任何輔助裝置。(The unit does not need further devices or operations to be set at work, except the execution of the electrical connection.)

A10Ex機器配有 3*2.5mm²護套電纜，接電必須接在工作場所之電力供應末端，必須使用手動式分區供電之裝置。此裝置可在必要的情況下將機器之電機系統與供電系統分開。(A10Ex unit is equipped with 3* 2.5mm² cable. The connection must be directly executed at the terminals of the source of the power supply existing in the work place. It is necessary for the presence of a feeding sectioning device by manual control. This device is able to allow the separation of the unit electrical equipment from the general feeding system.)

供電裝置如果位於遠離操作間之安全區，亦可採用非防爆之供電裝置。(If the power supply device is located in a safe area away from the operation area, then it is allowed to use non-anti-explosion power supply device.)

分區供電裝置如果位於操作間，必須採用符合中華人民共和國國家標準 GB3836系列，與產品使用環境相適應的防爆供電開關.且不低於回收機的防爆標誌。(If the power supply device is located in the operation area, it must match the regulation of “PRC national standards GB3836”, and it must be suited to the use of environmental anti-explosion switches.)


此裝置必須能負載 20A 電流。機器與電纜必須接地。(The device must be able to manage 20A currents. Additionally, the unit and the meter cable must be grounded.)

回收機的電氣佈線應符合GB3836.15-2000《爆炸性氣體環境用電氣設備 第15部分：危險場所電氣安裝（煤礦除外）》的規定。(The electrical wiring of the Solvent Recovery Machine should meet the regulations of GB3836.15-2000《Using Electrical Equipment in Explosive Gas Environment Part 15: Electrical Installation within Dangerous

Locations (Except Mining)》》.)

10.2 乾淨溶劑之管路連接 (Pipe connection for recovered solvent)

在機器回收桶內有一條塑膠管，將此塑膠管套在溶劑出水口上並鎖緊固定套環。(Within the tank, there is a plastic pipe. Connect this plastic pipe to the steam emission spout and tightly secure it with the hose-clamp.)

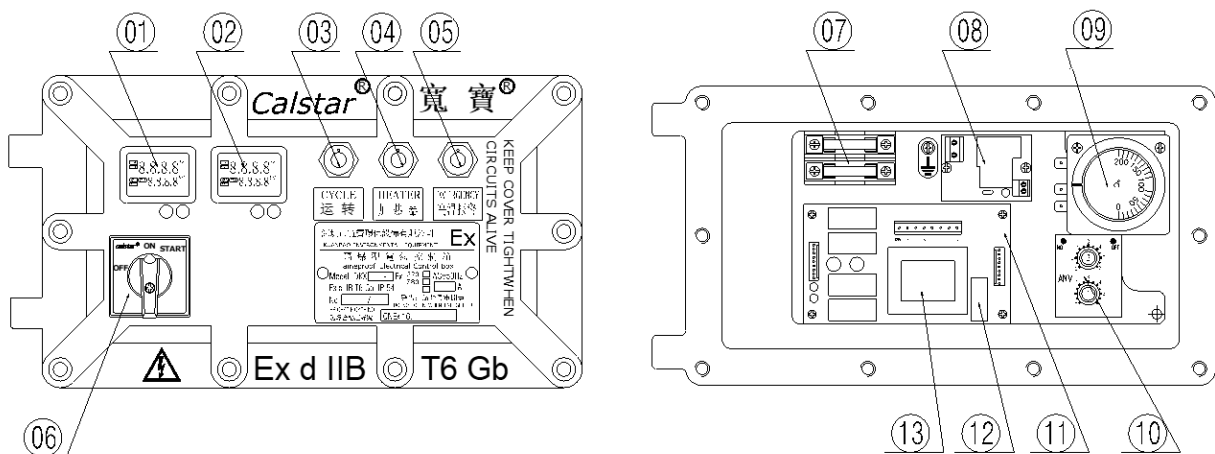
	<p>在設定操作之前，請詳讀此手冊，並學習正確的術語及機器之控制功能。 Before providing for the unit to be set at work, please read the instructions handbook carefully, and learn the terminology and the controls function of the unit in a correct and exhaustive way.</p>
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11.0 控制 (CONTROLS)

11.0.1 A10Ex電控箱及IC板平面示意圖如下: 双段加熱式

(A10Ex Control Box and IC Control Panel displayed below)

電控箱蓋正面(Control Box Front Cover) 電控箱裏面(Control Box Inside:)



01 加熱溫度控制器1段(Heating Temp Control phase 1)

02 加熱溫度控制器2段(Heating Temp Control phase 2)

03 運轉指示燈 (Operating light)

04 加熱器指示燈(Light of Heater)

05 高溫保護指示燈 (High Temp Emergency light) 06 啟動開關(Start main switch)

07 总电源保险管(Power fuse)

08 加熱器继电器 (Relay for heater)

09 關機溫度控制器 (Auto Temp Cut-off)

10 回收时间控制器(Timer of recovery process)

11 IC控制板 (IC Control panel)


12 IC控制板 保险管 (IC Control panel fuse)

13


變壓器(Transformer)

11.1 溫度控制器之設定 (Thermostats setting)

溫度控制器安裝在控制箱裏面，要設定溫度時，請先鬆開控制箱上螺絲。(The knobs for thermostats setting are placed inside the controls box. Unscrew the knob before setting temperature.)

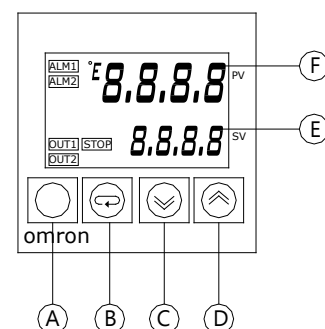
	<p>打開控制箱之前請關掉電源開關，溫度設定必須在無電力之情況下進行。</p> <p>Before opening the control box cover, turn the switch off. The thermostats setting need to perform under switch off condition.</p>
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溫度控制器依據被回收溶劑沸點來設定工作溫度，所以必需瞭解被回收溶劑之物理化學特性，尤其是沸點。(The thermostats must be set according to the solvent kinds to be recovered. It is therefore necessary to know the technical characteristics of the specific solvent to be recovered and in particular its boiling point.)

	<p>溫度設定必須由特定及熟練工作人員來執行。</p> <p>The thermostats setting must be executed by authorized and professional workers.</p>
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例如：在22°C室溫，蒸餾回收高沸點溶劑環己酮，如下表所示：

環己酮 (Cyclohexanone)	沸點(°C) (Boiling Point)	加熱溫度(°C) (Heating temperature)	關機溫度(°C) (Shut-Off Temperature)
常壓 (Atmospheric)	155	205	140
減壓(-500mm/Hg) (Decompression)	約 220 (About 220)	160	95



- 從開刀開關將電源關掉。(Turn off the main power switch.)
- 鬆開螺絲打開控制箱。(Unscrew the screws and open control box.)
- 將關機溫度控制器設定比溶劑之沸點低10~15°C。(Setting Shut-off Temp Control Device at 10-15°C lower than the solvents boiling point.)
- 將加熱溫度控制器設定比溶劑之沸點高30~50°C。(Setting Heating Temp Control Device as the solvent boiling point plus 30-50°C.)

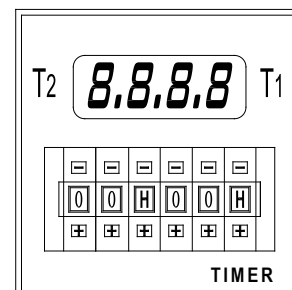
- 將高溫保護溫度控制器設定比加熱溫度控制器設定溫度高10~20°C. (Setting High Temp Emergency Temp Control Device at 10- 20°C higher than the Heating Temp Control Temperature.)

11.2 時間控制器之設定 (Timer control device setting)

時間控制器即加熱時間控制器,時間控制器可設定回收機加熱時間。
機器启动后,按照预设时间自动运行,由T1运行时间结束自动转入T2时间运行,T2运行结束自动关机;

(Time controller that is the heating time controller, the time controller can set the recovery time of the recycling machine.

After the machine is started, it will run automatically according to the pre-set time, and will be automatically transferred by the end of T1 run time, T2 time to run, T2 run end automatically shut down;)



完成溫度控制器設定後, 時間控制器之設定程式如下 (After completing the procedures for the thermostats setting, the timer settings should be set as followed):


- 在初次使用機器回收時,應有人全程值守. (Upon the first use of the unit, assistance is required throughout its working.)
- 將時間控制器T1,T2調整至3hrs(如上圖所示). (Set the timer with the 3 hours (as described in the picture).)
- 開機並記錄:開機時間,乾淨溶劑流出時間,關機時間. (When switching on the unit, record the following: Time the unit switched on, time the recovered solvents start flowing out, and time the unit is switched off.)
- 將回收全過程時間(即關機時間減去開機時間)T2減20分鐘,即為時間控制器初次設定時間,然後依據實際操作中之殘渣情形適當增減時間. (The initial setting time should be(T2) 20 minutes less than the whole process of the solvent recovery time (time the unit is switched off minus time the unit is switched on). Appropriately set the time according to the condition of the residues after actual operation.)
- 如果認為殘渣太幹,則T2時間應減少;如果認為殘渣中溶劑太多,則T2時間應增加即可. (If the residues are too dry, decrease the recovery T2 time 10 minutes; if there are excess solvent within the residues, increase the recovery T2 time as suitable.)

※ 特別聲明(Reminder):

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如果廢液殘渣中含有硝基油漆(即硝化纖維類物質)或銀粉類物質，則加熱時間與加熱溫度設定，都應視殘渣情形適當減少加熱時間與加熱溫度，以免殘渣過熱引起冒煙!!

(If waste solvent contains nitro-painting (i.e. nitrify fiber type substances) or aluminum powder type substances, the heating time and the distillation thermostat temperature should be regarded with appropriate reduction, in order to avoid residues overheating and emission of smoke!!)

	<p>完成控制器之設定後，請鎖上螺絲上緊控制箱！ 無論在何種情況下，請勿自行修改或更換控制箱及其電子元件！因為原先之設計是考慮到機器有可能處於容易發生爆炸之環境中，任何更改都可能降低回收機之安全性！！ After complete control box setting, remember to screw up the control box tightly. Under any circumstances, don't change or replace the control box parts by yourself. Any changes by yourself may cause serious explosion and affect the safety protection system.</p>
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12.0 技術資料 (TECHNICAL DATA)

機器型號(Unit Type)	A10Ex	
進料容量(Filling capacity)	10	L
回收桶容量(Tank volume)	15	L
熱媒油容量(Heat Transfer oil volume)	5.5	L
加熱組件功率(Distillation element power)	2.0	KW
電風扇功率(Electro-blowing-fan power)	0.09	KW
最大功率(Maximum installed power)	2.2	KW

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最大電流(Maximum absorption)	9.5	A
電源電壓(Power Voltage)	110/60HZ	ACV/HZ
控制電壓(Control Voltage)	24	DCV
加熱方式(Heating method)	熱媒油間接加熱 (HTM indirect heating oil)	

長度(Length)	655	mm
寬度(Width)	505	mm
高度(Height)	1050	mm
重量(Weight)	62	Kg
操作溫度(Working temperature)	50 ~ 190	°C
理想工作室溫(Ideal room temperature)	5 ~ 30	°C
噪音(Noise)	65	dB

在未降低安全標準之前提下,為使機器性能更加完善,製造商保留對機器作適度修改之權利。

(**Calstar** reserves the right to make on their own units all the improving modifications considered suitable, without altering the achieved safety standard.)

12.1 銘牌 (Data plate)

MODEL 型號	Ex-	防爆溶劑回收機 Ep solvent recovery	Ex
EP CERTIFICATE NO. 防爆合格証編號:	CNEx	YEAR 年份	Kg 淨重
ACV 電壓	?	Hz 頻率	50/60
Ex d IIB T2 Gb		kW 功率	No. 編號
Calstar Associates Company (USA) Authorization Shenzhen kuanbao environmental Equipment Co., Ltd. Add: Shenzhen Pingshan District Tangkeng Road Jiademaluan Industrial Park 1-Zone-19# TEL: (86)755-27568436 FAX: (86)755-84621232 Http://www.calstar.cn Customer service : 40008 365 18		美國凱勒達有限公司 監製 深圳市寬實環保設備有限公司 製造 深圳市坪山新區湯坑路 家德馬魯工業園1區19棟 TEL: (86)755-27568436 FAX: (86)755-84621232 Http://www.calstar.cn 客服电话: 40008 365 18	


13.0 使用 (Use)

13.1 準備 (Setting)

必須準備一個大於被回收溶劑容量之溶劑桶, 用來裝回收出來之乾淨溶劑, 溶劑桶之材質或結構必須可防止靜電積累, 且不會被溶劑腐蝕。

(It is necessary to prepare a suitable tank to use for the recovered solvent collection. The material of this tank must be compatible with the nature of the solvent to be recovered and of the relative pollutants and must be provided with a sufficient conductivity.)

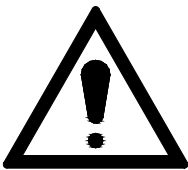
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	<p>溶劑桶必須有兩個開口，一個是作被回收溶劑之入口，另一個是作溶劑蒸汽之透氣口，而透氣管必須拉到室外，桶體接地工作必須在每次蒸餾回收前完成。</p> <p>在每次蒸餾回收前必須執行上述步驟，以避免溶劑蒸汽在密閉空間裏積累及產生靜電。</p> <p>The tank of the recovered solvent must have two openings, the one for the recovered solvent inlet, and the other one as breathing of the solvent steams. The breather pipe must be taken outside. The grounding of the tank must be executed.</p> <p>These operations must be executed before every distillation cycle and are necessary to assure that solvent steams do not spread in closed places and to prevent from the creation of electrostatic charges bunching.</p>
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13.2 檢查蒸汽管路及桶蓋墊圈 (Check of the steam pipes and lid seal)

每次蒸餾回收之前必須檢查蒸汽管路是否阻塞或洩漏，這可延長桶蓋墊圈之壽命。

(This check must be executed before every distillation cycle and is necessary to make sure of the absence of obstructions and leaks in the steam pipes. It is also useful for establishing the good condition of the lid seal.)

	<p>請小心維護桶蓋墊圈! 墊圈洩漏會造成大量可燃蒸汽外泄, 引起起火及爆炸風險增大!!</p> <p>桶蓋墊圈是以耐高溫耐溶劑之特殊材質製成，請不要隨意更換不是來源於製造商或代理商之墊圈。</p> <p>The lid seal is made of high heat and solvents resistant special material. Never replace this seal with another one which does not come directly from Calstar or from an authorized reseller.</p>
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13.3 檢查程式 (Check procedure)

- 關掉主電源開關。(Cut out the electrical feeding of the unit)
- 松掉桶蓋鎖緊手柄。(Unscrew the knob.)
- 打開桶蓋。(Open the lid.)
- 關閉溶劑輸出閥門。(Close solvent output valve.)
- 檢查桶內是否干淨(Check whether the tank inside is clean)

14.0 進料 (FILLING)

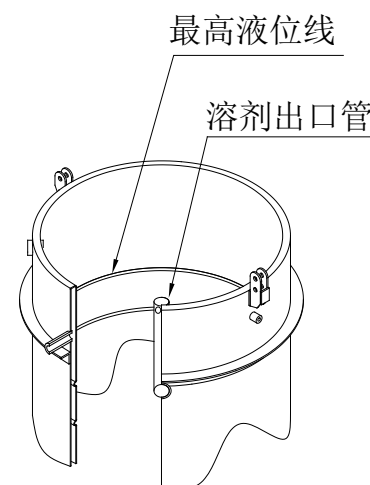
考慮溶劑一般都具有危險性，所以在存放及進料過程中都必須很小心。傾倒溶劑時應小心，避免溶劑濺射，以免造成皮膚受傷及異味。

(Considering the generally dangerous nature of solvents, it is necessary to pay attention when moving the tanks and during the filling of the Solvent Recovery Machine tank. It is useful to execute the pouring-off from the tank

with care to avoid sprays that could be harmful by touch and/or smell.)

在進料前請確認 (Before filling the tank make sure that) :

- 上次蒸餾回收已完成。(The previous cycle is over.)
- 機器之溫度已冷卻至室溫。(The unit is cool (room temperature).)
- 回收桶是空的而且是乾淨的。(The tank is empty and clean.)



14.1 進料程式 (Filling procedure)

- 關掉電源開關。松掉桶蓋鎖緊手柄。(Cut out the electrical feeding of the unit. Unscrew the knob.)
- 拉開桶蓋軸活銷，取下桶蓋，墊圈向上放好。(Open the lid.)
- 倒入被回收的溶劑並勿超過桶內最高液位線(如圖所示)。如果溶劑會發泡或很黏稠，應適當減少進料容量或靜置澄清後再回收，以免管路造成堵塞或機器回收效率降低。(Fill the tank with the solvent to be recovered, but do not overfill the maximum level marked in its inside (see picture). In order to avoid an obstructed condensing coil or a decreased working efficiency, if the solvent is foamy or very thick, appropriately reduce the input capacity.)
- 清潔回收桶邊緣，蓋上桶蓋。鎖上桶蓋手柄並確定桶蓋上緊。(Clean the edges of the lid, and close the lid.)
- 按照13.1 “準備”之指示，準備一個桶，用來裝回收後之溶劑。(Place an empty and clean tank for the recovered solvent collection, following the instructions of the paragraph 13.1 “Setting”.)

15.0 操作 (WORKING)

確定桶蓋墊圈上緊之後，就可以執行回收操作。(After having assured the machine lid is sealed and having checked that the controls box is tightly closed, proceed to the working procedure.)


15.1 啟動操作程式 (Cycle starting procedure)

- 給系統供應壓縮空氣和電源。(Supply compressed air and power for machine.)
- 把啟動開關從“0”轉至“1”位置。(Turn start switch from position “0” to position “1”.)
- 數字溫控器會亮，代表已接通電源。(The Heating Temp Control light, which reveals the controls panel switches is on.)
- 輕輕扳動啟動開關至“2”位置，然後鬆手，啟動開關會自動回至“1”位置。(Turn start switch to position ‘2’ and release, it will return automatically.)
- 運轉指示燈會亮，代表機器已開始加熱油品。機器自動運轉，依照加熱溫度控制器所設定溫度，加熱器指示燈會指示加熱器工作狀態。(The working light is on which representing the unit is heating the oil. The unit starts working automatically. According to the temperature set on the distillation thermostat, the distillation light will indicate the working status of the heating device.)
- 機器自動運轉，依照加熱溫度控制器所設定溫度，經過一段預熱時間後乾淨溶劑會自動流

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出。回收完畢後，機器會自動關機，運轉指示燈熄掉，而數字溫控器會亮保持亮著。

(The unit starts working automatically according to the temperature set on the distillation thermostat. The distilled product will start coming out. At the end of the cycle, the unit automatically shuts off. The working light switches off, and the Heating Temp Control remains on.)

	<p>無論何種理由，請勿觸摸回收桶，以免高溫燙傷！ (Never touch, for any reason, the upper side of the tank during the distillation cycle.)</p> <p>無論何種理由，請勿在執行回收過程中傾倒回收桶！ (Never overturn, for any reason, the tank before the end of the distillation cycle.)</p> <p>無論何種理由，請勿在執行回收過程中鬆開桶蓋手柄！ (Never unscrew, for any reason, the lid knob before the end of the distillation cycle.)</p> <p>無論何種理由，請勿在執行回收過程中打開電控箱！ (Never open, for any reason, the lid before the end of the distillation cycle.)</p>
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16.0 殘渣清除及清潔機器，如下圖所示 (RESIDUALS DISCHARGE AND UNIT CLEANING ,Pictured below):


每次回收結束後，必須將回收桶內殘渣清除乾淨！！！！

(The tank must be cleaned from residuals at the end of every distillation cycle!!)

特別提示(Reminder):

※ 回收桶內積累殘渣是非常危險的！！！！ 這不僅會造成機器回收效率嚴重降低而且局部過熱引起回收桶變形、開焊，還會造成殘渣冒煙起火！！！！

(If the accumulated residues within the tank are not cleaned, it will damage the unit. Not only can it significantly decrease the working efficiency, but the high temperature can deform the tank, and can possibly start a fire.)

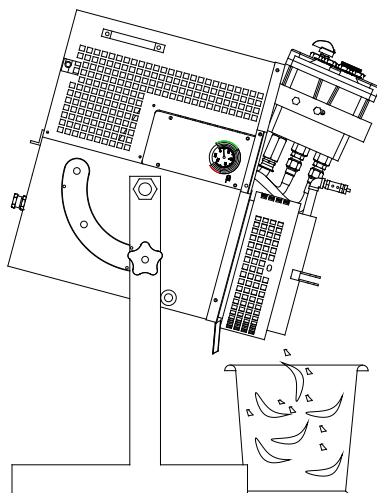
	<p>當結束回收蒸餾後，在打開桶蓋執行清渣工作之前，請確認熱媒油溫度錶之溫度，如果溫度還很高，則清渣時必須小心處理，以免燙傷！！！！</p> <p>When cycle is over, check the Heat Transfer Oil temperature on the thermometer, before opening the lid and carrying out the residuals discharge. Open the lid to discharge the residuals with greatest care in relation to residual temperature.</p>
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16.1 回收桶清潔程式 (Tank cleaning procedure)

- 扳回啟動開關至“0”位置。關掉提供回收機電源之閘刀開關。(Turn the lever of the switch to position 0 (zero).)
- 檢查熱媒油溫度錶之溫度(其溫度與殘渣之溫度很接近),確定熱媒油溫度錶已降至接近室

溫，可進行以下操作。(Check the Heat Transfer Oil temperature, which is similar to the residual temperature, on the thermometer. Make sure the temperature is close to room temperature, and can therefore continue on with the following procedures.)

- 在回收機下放一個適當之裝殘渣金屬桶。(Place a metallic tank of suitable capacity under the unit.)
- 根據殘渣之溫度鬆開桶蓋手柄，打開並移走桶蓋。(open and remove the tank cover according to temperature of residual.)
- 將桶蓋(墊圈向上)放好。(keep the seal-ring is up while placing the tank cover)
- 向外拉出安全鎖止銷(安全鎖)並抓緊機箱前面罩上的拉手，將機器往後緩慢翻轉傾倒，讓殘渣緩慢流入殘渣桶里，直至機箱上的定位柱與机架完全接觸，此時機器處於安全穩定狀態，可進行下一步清理工作。(Pulling out safety shotpin, hold tightly the handle on the machine, slowly tilting till the location pillar touching the frame of machine. Then discharge residual.)
- 在必要的情況下，可以使用不尖銳的非金屬工具，輔助清理。(Clean the inside of the tank from all the distillation residuals, using if necessary, a non-metallic and not a sharpened tool.)
- 將回收桶上沿及桶蓋墊圈上的殘渣清理乾淨，以確保墊圈更長的壽命。(Clean the tank upper edge and the lid seal from distillation residuals, to guarantee a longer lifetime of the seal.)
- 清理完畢後，使機器恢復至水平工作位置，安全鎖止銷自動鎖止，機器穩定狀態。(To reset the machine to its initial position after discharging, and to lock shotpin.)



注意：核對蒸餾殘渣之特性是必要的，依據殘渣之化學組成，分為再利用物質，特殊殘渣廢棄物，有毒廢棄物及其它。請依使用者當地之法規來再利用，存放或清除此殘渣。


(Notice: It is necessary to check the distillation residuals nature. The residuals, according to their chemical composition, can be classified as reusable materials, special wastes, and toxic harmful wastes or otherwise. According to the kind of the obtained residual, it is necessary to provide for reuse, stocking, or elimination in observance of the laws in force in the user's country.)

17.0 定期保養 (ROUTINE MAINTENANCE)

所有的定期保養必須在機器處於室溫狀況下，請依據下述步驟來執行定期保養工作(All the maintenance operations must be carried out when the unit is at room temperature):

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- 帶上防護手套，防護眼鏡，防毒面罩。(Wear working gloves, protective glasses, gas mask and fireproof instruments.)
- 確定回收桶是空的。(Make sure the tank is empty.)
- 切掉機器之電源開關。(Cut out the electrical feeding of the machine.)

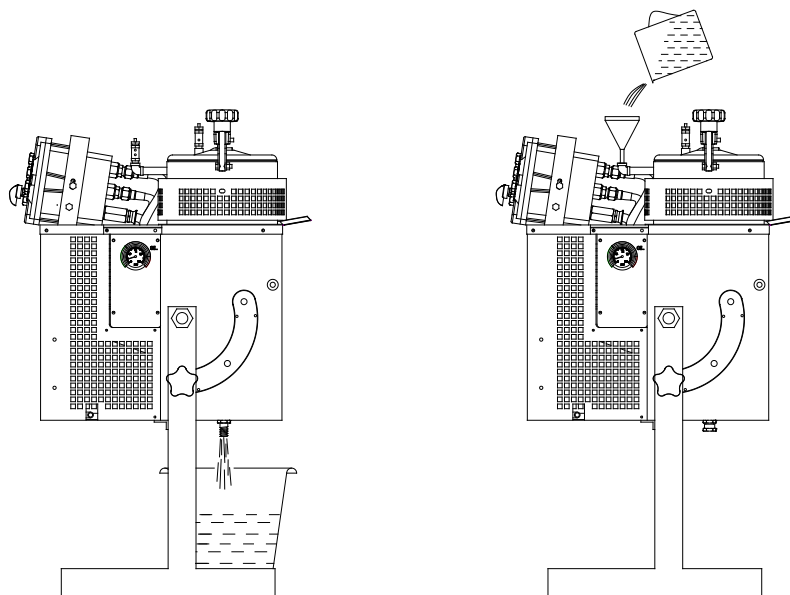
	<p>每次有關於電力方面的操作，縱然很簡單，還是需要專門的技術電工來執行。</p> <p>Every operation on the electrical plant, even if easy, requires the labor of skilled workers.</p>
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18.0 清潔 (CLEANING)

每個月至少一次，使用壓縮空氣將冷凝器散熱片與風扇葉片上灰塵清理乾淨。(At least once a month keep the condenser carter and wings free from dust and/or fouling to avoid the efficiency decrease of the steam cooling system. For cleaning it is sufficient to use compressed air.)

19.0 更換熱媒油 圖如下：

(HEAT TRANSFER OIL REPLACEMENT, Pictured below :)



為保證機器加熱元件之壽命及機器回收效率良好而連續正常工作，請依照電控箱內累時器之工作累計時間指示，定期更換熱媒油；長久未更換熱媒油，油品質量會降級劣化，產生焦化與結碳現象，同時產生酸物質，腐蝕回收桶及加熱器，黏度增高流動性變差，系統導熱下降，機器回收效率降低，還會引起加熱棒嚴重積碳過熱而燒損。熱媒油劣化速度與機器運行溫度有關，溫度越高，劣化速度越快。

(To ensure the longevity of the unit components and machinery heating efficiency, please regularly change the Heat Transfer Oil according to the accumulated time device, which is located in the control box.

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If the Heat Transfer Oil is not replaced for a prolonged time, the quality of the Heat Transfer Oil will demote, causing scorches and forming carbon. At the same time, it produces acid substances, corrodes the tank and heating device, the viscosity increases while the mobility deteriorates, the heat conduction in the system drops, the working efficiency decreases, and can possibly inflict serious damage on the heating rods through overheating. The speed at which the Heat Transfer Oil deteriorates is correlated to the unit operating temperature. The higher the operating temperature, the faster the Heat Transfer Oil deteriorates.)

每隔1000工作小時，建議必須更換熱媒油！(The Heat Transfer Oil must be replaced every 1000 working hours and, in any case, every year.)

如非必需請勿更換不是來自**Calstar**公司或代理商之熱媒油！(If non-essential, please do not replace the Heat Transfer Oil with another one which does not come directly from the **Calstar** Company or other authorized reseller!)

機器使用熱媒油是**CALSTAR D50, CALSTAR D66**,或是同一性質不同品牌熱媒油，如：日本綜研化學株式會社 Neo SK-OIL, Essotherm 550.TOTAL K3120等等。必須確定熱媒油含水量不超過2%，如果含水量超過2%，當溫度超過100°C時，在油槽內會產生大量蒸汽進而會損壞機器。(The used Heat Transfer Oil is **CALSTAR D50, CALSTAR D66** or anyhow an oil with the same characteristics (for example **Japan Research Institute of Chemical Co. Neo SK-OIL**, TOTAL K3120, ESSOTHERM 550, DIATHERM 80, etc.). It is necessary to make sure that the oil does not have a humidity rate more than 2%. In fact, the presence of water in the Heat Transfer Oil, at temperatures higher than the water boiling temperature, 100°C, causes the formation of steam inside the oil tank, which prejudices the working of the machine.)

嚴禁混合使用不同品牌之熱媒油，這樣會使加熱器受損破裂或回收桶破裂！！(Do not mix Heat Transfer Oil from different brands; it may cause serious damage to the heating device and the tank!!)

19.1 更換熱媒油程式 (Procedure for heat transfer oil replacement)

- 在機器下熱媒油出口處，放一個容量適當的桶子。(Place a suitable container under the unit.)
- 松掉泄氣閥。(Unscrew the drain plug.)
- 松掉並取下放油螺絲。(Unscrew and take off the drainage plug.)
- 讓劣化的熱媒油流入桶內。(Let all the exhausted heat transfer oil drain into the container.)
- 上緊放油螺絲。(Screw the drain plug again.)
- 使用漏斗由泄氣閥倒入相應公升之新熱媒油。(參照12.0技術資料) (Pour suitable liters of unused heat transfer oil through the drainage plug, using a funnel. (see paragraph 12.0 “Technical Data”))
- 上緊泄氣閥。(Screw the breather plug again.)

更換熱媒油後，在回收過程中，如果加熱溫度超過160°C時，熱媒油有可能會從泄氣閥流出，此時請將泄氣閥流出之熱媒油擦拭乾淨，並不影響機器正常工作。(Heat Transfer Oil in excess may come out from the drainage plug during the distillations if the distillation thermostat is set at temperatures higher than 160°C. In this case, clean the leaked heat transfer oil from drainage plug.)

20.0 保固 (WARRANTY)

本機器自交貨安裝後免費保固三年，終身維護。在保固期間如果機器或零件壞掉可聯絡廠商及代理商，經檢查確定不是在錯誤使用情況下造成之損壞，製造商及代理商可提供免費修理服務。(The machine has a three-year warranty, starting from the delivery date. In case of Solvent Recovery Machine or its components are out of order, contact **Calstar** or to its local agent for FREE SERVICE.)

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當遇到下述情況免費保固會自動終止：如錯誤之使用方式導致機器損壞；客戶私自拆裝分解機器導致機器損壞；未依照本《說明書》之指示實施操作。（During the warrantee period, the warrantee will be suspended if the problems happened by irregular operating against maintenance instructions, client replace parts by themselves.）

選擇性配備不在保固範圍內，保固不包括消耗性零件，如：開關、指示燈、墊圈、熱媒油等。（We don't offer warrantee or replace the wearing parts, such as switches, remote control switches, warning lights, seals, etc.）

檢修回收機時，拆裝各防爆電氣部件，應注意保護隔爆面，不得有損傷和銹蝕，裝配時，隔爆面塗204-1防銹油。（When maintaining the unit by disassembling anti-explosion electricity part, pay attention to the protective anti-explosion surface that there are no damages, defectiveness, or rustiness inflicted. When assembling, it is advised to paint a layer of 204-1 rust-proof oil on the anti-explosion surface.）

不允許隨意改變防爆結構和更換影響防爆性能的元器件和零部件，電纜引入裝置密封圈老化變質時，應及時更換密封圈。我公司有配件，須在我公司購買。（Unauthorized rearranging of the anti-explosion structure or replacing anti-explosion primary device and spare parts are prohibited. Promptly replace the seal for the electricity-importing device when it wears out or degenerates. The manufacturer has spare parts. To purchase it, please contact the **Calstar** Company.）

21.0 故障之原因及排除 (TROUBLES SHOOTING)

	<p>每次只要有關電力方面之操作，縱然很簡單，還是需要專門電工技術人員來執行。</p> <p>Every operation on the electrical plant, even if easy, requires the labor of skilled workers.</p>
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問題(PROBLEMS)	解答(POSSIBLE SOLUTIONS)
A) 電源指示燈不亮且機器無法運轉。(The white warning light does not switch on and the unit does not work.)	<ol style="list-style-type: none"> 1) 檢查電力網絡中是否有電。(Check the effective presence of electrical power in the power grid.) 2) 檢查匣刀開關是否打開。(Check if the general knife switch of the electrical plant is on.) 3) 檢查保險絲是否燒壞。(Check the state of the fuses.) 4) 檢查控制箱內變壓器上方之保險座裏保險絲是否燒壞。(Check the state of the fuse which is placed inside the controls box, on the right-bottom of the transformer inside a black fuse carrier with pressure-cap.)
B) 機器可開機，但無法加熱。(The unit switches on and works, but it does not heat.)	<ol style="list-style-type: none"> 1) 請參考溫度控制器之設定，檢查設定是否正確。(Check if the thermostat setting is correct.) 2) 使用電流錶檢查加熱元件之電流。(Verify the functionality of the heating element, checking the unit inputs by an amperometric measurer.)

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	3) 熱媒油是否長久尚未更換。(Check if the Heat Transfer Oil has not been replaced for a long time.)
C) 回收廢液中溶劑之成份並不知道。(The percentage composition of the mixture solvent-pollutant is not known exactly.)	1) 設定加熱溫度控制器在160°C。(Set the distillation thermostat at 160°C.) 2) 設定關機溫度控制器在 50°C。(Set the automatic-cut-off thermostat at about 50°C.) 3) 等到乾淨溶劑流出時,降低溫度控制器溫度,直到綠色指示燈及電風扇同時關掉。(When the recovered solvent starts to flow out, slowly lower the temperature set of thermostats until the green warning light and the axial flow fan switch off simultaneously.) 4) 此時關機溫度控制器上之溫度即是溶劑之沸點。由此溶劑之沸點再依照“溫度控制器之設定”重新設定溫度控制器即可。(Read on the automatic-cut-off thermostat knob the temperature which corresponds to the solvent boiling temperature. Execute the setting of the thermostats using the taken temperature to obtain the perfect working of the Solvent Recovery Machine and the automatic switching off at the end of the cycle.)
D) 回收機無法將全部之溶劑回收出來。(The unit does not recover all of the polluted solvent content.)	檢查溫度控制器之設定是否正確。(Check if the setting of the thermostats is correct.)
E) 機器正常運轉,但是溶劑無法流出。(The unit works but the recovered solvent does not come out.)	檢查是否因為進料太多造成管路阻塞(Check if the condensing coil is obstructed because of the solvent tank overfilling. For checking, it is necessary to): 1) 打開桶蓋。(Open the lid) 2) 由溶劑出水口吹入0.2Bar壓縮氣體,檢查是否有足夠之空氣吹出(請參照“13.3”檢查)。如果有阻塞現象,請與 Calstar 公司或當地代理商聯繫。(Blow air at a pressure of 0.2 Bar inside the outlet pipe for the recovered solvent, checking if there is an adequate air passage (see paragraph 13.3 “Checking Procedure”). If not, contact the Calstar Company or the nearest authorized reseller for the steam pipe disassembly and the obstructions removal.)
F) 回收出來之溶劑不乾淨。(The recovered solvent comes out dirty.)	1) 進料過多,超過最高液位線。(The solvent tank has been filled over the maximum capacity line.) 2) 回收廢液會發泡,此時請減少進料容量。(The dirty solvent is mixed together with very particular foamy products, thus making necessary a lower filling of the solvent tank.) 3) 當上述2種情況發生時,冷凝管路會污染及阻塞,請用5公升之乾淨溶劑進行回收以便清洗冷凝管

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	路。(When the above two conditions occur, the condensing coil is partially plugged. Please arrange a distillation cycle with about 5 Liters of clean solvent to clean the condensing coil. It is possible to clean it by arranging a distillation cycle with about 5 Liters of clean solvent.)
G) 蒸汽從墊圈洩漏出來。(Steam comes out from the lid.)	<p>1) 檢查蒸汽冷凝管路是否阻塞, 絕大多數蒸汽洩漏是此種原因造成的。(Check if the condensing coil is partially plugged, most of the steam leakage is caused by this problem.)</p> <p>2) 檢查墊圈之密封性。(Check the gripping of the lid.)</p> <p>a) 蓋上桶蓋並鎖緊手柄。(Close the lid and screw the knob tightly.)</p> <p>b) 由溶劑出水口吹入0.2Bar壓縮氣體, 檢查墊圈是否洩漏。(Blow compressed air at a pressure of 0.2 Bar in the outlet pipe, and check whether or not the lid has a leakage.)</p> <p>3) 如果墊圈洩漏, 請更換新的墊圈。(If there is a leakage within the lid, please replace it with a new one.)</p> <p>檢查墊圈有無破損。(Check the state of the seal.)</p>
H) 流出熱的溶劑。(The solvent comes out hot.)	<p>1) 檢查電風扇是否正常運轉。(Check if the electro-blowing-fan works correctly.)</p> <p>2) 檢查冷凝器是否沾滿髒的東西、灰塵。(Check if the electro-blowing-fan carter is closed by dust, fouling, etc.)</p> <p>3) 檢查溫度控制器之設定是否正確。(Check the setting of the thermostats (see paragraph 11.1 "Thermostats setting").)</p> <p>檢查工作環境通風散熱是否良好。(Check if the working environment and ventilation are prosperous.)</p>

22.0 長久暫停使用機器 (PUTTING THE UNIT ASIDE FOR A LONG TIME)

如果機器停止使用超過60天時間時, 請按下述步驟執行(If the unit is not used for a period longer than 60 days, then execute the following operations):

- 將機器之電源線由閘刀開關上拆下來, 並妥善的保護。(Cut off the unit from the electrical connection and protect the cable properly.)
- 將桶內的殘渣倒掉並清理乾淨。(Drain off and thoroughly clean the unit tank.)
- 鬆開溶劑出水口管子上之固定套環並將管子拆下。(Take off the solvent outlet pipe after having loosened the pipe wrench clamp.)
- 不要將機器暴露在太陽及高溫下, 否則會導致桶蓋墊圈劣質老化。(Do not leave the unit exposed to the sun or other heat sources, since these conditions could dry seals and flue pipes.)

23.0 廢料 (SCRAPPING)

從回收桶內清理出來的殘渣廢料應視為特殊廢棄物, 請按照當地法規將廢料進行處理。

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(Having to cast off the unit and wishing to eliminate the residuals discharge, it will be necessary to consider it as special waste, separate it in homogeneous parts and dispose according to effective local laws.)

24.0 附錄 各種溶劑之物理性 (Appendix) (The Properties of Various Solvents)

項次	溶劑中文名稱	English name	沸點(°C)	比重(低)
01	甲苯	Toluene	220.000	0.8669
02	二甲苯	Xylene	137.000	0.8540
03	三甲苯	Trimethylbenzene	164.700	0.8650
04	四甲苯	Tetramethylbenzene	205.000	0.9020
05	乙酸乙酯	Ethyl acetate	77.000	0.9000
06	乙酸正丁酯	Butyl acetate n.	126.300	0.8820
07	乙酸仲丁酯	Butyl acetate sec.	112.200	0.8700
08	乙二醇酯	Monoglicol acetate	178.000	1.1090
09	乙酸-2-乙氧基乙酯 (CAC)	Ethoxyethyl acetate	156.300	0.9730
10	乙醇	Ethanol	78.320	0.7893
11	丁醇	Butyl alcohol	117.000	0.8100
12	二甘醇	Diethylene glycol	240.000	1.1200
13	甲醇	Methanol	64.510	0.7913

14 alcohol sec. 107.900
0.8020

15	異丙醇 (IPA)	Isopropyl alcohol	82.400	0.7860
16	環己醇	Cyclohexanol	161.000	0.9493
17	二氯乙烷	Dichlorethane	84.000	1.2550
18	二氯丙烷	Dichloropropane	96.400	1.1560

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19	二氯甲烷	Methylene chloride	39.750	1.3260
20	三氯甲烷	Methyl chloride	61.000	1.4890
21	環己烷	Cyclohexane	80.719	0.7790
22	溴丙烷	Propyl bromide	70.970	1.3597
23	四氯乙烷	Tetrachlorethane	146.300	1.6000
24	1,1,1.-三氯乙烷	Trichloroethane 111	74.000	1.3492
25	四氯乙烯	Perchloroethylene	121.200	1.6230
26	三氯乙烯	Trichloroethylene	87.190	1.4640
27	丁酮 (MEK)	Methyl ethylketone	79.640	0.8049
28	丙酮	Acetone	56.100	0.7905
29	甲基異丁基酮	Methylisobutylketone	115.900	0.8000
30	環己酮	Cyclohexanone	155.650	0.9478
31	乙醚	Ethyl ether	34.600	0.7140
32	乙二醇一丁醚 (BCS)	Butyl cellosolve	170.200	0.9008
33	乙二醇一乙醚 (ECS)	Ethyl cellosolve	135.600	0.9295
34	氟利昂 113	Freon 113	47.600	1.5650
35	氟龍	Isoforone	205.000	0.9200
36	NN-二甲基甲先胺 (DMF)	NN-Dimethylformamide	153.000	0.9430
37	白電油		60—220	0.68—0.72