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CT(TG)型热风循环烘箱
CT(TG) Series Hot Air Circulation Oven



使用说明书
Operation Manual

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前 言

首先感谢您使用我公司生产 CT 系列的热风循环烘箱，本产品是严格按照行业标准《CT 系列热风循环烘箱》组织生产的。

Thank you for using the CT Series Hot Air Circulation Oven produced by Hywell Machinery Company. This product is produced in accordance with Enterprise standard " CT Series Hot Air Circulation Oven ".

在安装和使用之前，请仔细阅读本手册。如若不遵守本手册的说明而造成的人身伤害、机器损坏及其他财产损失我们将不承担任何责任。如有疑问，请与我们联系，我们将及时、热情地为您提供服务。

Please read this manual carefully before installing and using the machine. If user do not comply with the instructions of this manual, Hywell machinery company will not be responsible for personal injury, machine damage and other loss of property. If you have any questions, please contact us and we will serve you in a timely and warm manner.

本手册主要针对 CT 系列热风循环烘箱的结构特征、工作原理、安装与调试、使用与维护、故障分析与排除以及运输、贮存等方面做出说明。有关与物料接触部分的材质报告、主要器件（如 PLC 控制器、触摸屏等）等的技术资料等，我们将以其他随机附（文）件方式向您提供。

This manual mainly explains the structure features, working principles, installation and commissioning, operation and maintenance, troubleshooting, transportation and storage of CT Series Hot Air Circulation Oven. There is a material report and the information of the main components(such as PLC and touch screen). We will provide you with other random documents according to your request.

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本手册适用于CT-C-O 至CT-C-IV 系列热风循环烘箱。本系列其他规格产品以及用户特殊定制 的其他规格的同类产品可参照使用。

This manual book is suitable for CT-C-O and CT-C-IV Series Hot Air Circulation Oven. This series of other specifications and other products of special-ordered and other specifications of the same product can be used as reference.

本手册中出现的 product 外观或其他图例或菜单屏幕等与实际产品有所不同，使用时以实际产品为准。

If there is inconsistency between the manual book and the actual product, the actual product shall govern.

在用户遵守保养和使用规则的前提下，在调试验收之日 12 个月内，如确实因产品制造原因而影响使用时，本企业无偿给予修理或更换。

On the premise of user's compliance with the rules of maintenance and use, within 12 months of commissioning and acceptance, if the product is actually affected by the manufacturing cause, the enterprise shall pay the repair or replacement without compensation.

由于产品的不断改进, 本手册中的技术参数如有修改, 恕不另行通知.

如果您对本产品有其他疑问或者看法而本说明书内容未尽其详, 请及时提出咨询, 我们将很乐意回答您提出的问题、建议和批评. 感谢贵公司的选择和您的信任!

Due to the continuous improvement of products, such as the technical parameters in this manual are modified without prior notice.

If you have any questions or view the contents of this manual and the details of all time,

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please put the consultation, we will be very glad to answer your questions, advice and criticism.

Thank you for your choice and your trust!

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1.关键提示 Keynotes

本手册中，将在不同的地方出现表 1 中列出安全和警告提示，请务必注意。

In this manual, a list of safety and warning signs will be displayed on the machine as the listed in Table 1 at different places. Be sure to pay attention to it.

表 1 安全和警告提示

Table 1 Safety and warning signs

	触电危险，可能导致死亡或重伤 A risk of a electric shock that may cause death or serious injury.
	机械伤害危险，可能导致死亡或重伤 A risk of a mechanical injury that may cause death or serious injury.
	跌落危险，可能导致死亡或重伤 A risk of a fell injury that may cause death or serious injury.
	危险警告，可能导致伤害 Danger warning, which may cause injury
	可能导致设备故障或非预期停机 It may cause equipment failure or unexpected shutdown
	操作提示和 有用的信息 Operational hints and useful information
	非维护状态时，禁止触摸，否则可能导致伤害 Non - maintenance state, forbid to touch, otherwise it may cause damage

1.2 遵守本手册的规定是保障您人身和财产安全、设备质量保障和正常运行的前提。

Compliance with the provisions of this manual is a prerequisite for the safety of your personal and property, the quality of the equipment and the normal operation of the equipment.

1.3 本手册提供了 CT 系列热风循环烘箱正确安装、使用和维护的重要资料，请在设备安装位置附近妥善保管

This manual provides important information for the correct installation, use and maintenance of the CT Series Hot Air Circulation Oven. Please safekeeping.

2 安全说明 Safety instructions

下列安全说明涉及 CT 系列热风循环烘箱的运输储存、安装于调试、使用与维护保养，忽略说明，可能造成人身伤害或财产（设备/原料/产品）损失。

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The following safety instructions relate to transportation storage, installation, commissioning, operation and maintenance of CT Series Hot Air Circulation Oven. Ignoring instructions may cause personal injury or property (equipment / raw material / product) losses.

2.0 概述 Summary

设备运行时有：带电部件、运动部件、发热部件；设备停机有带电部件。

When the equipment is running, there are charged parts, moving parts, heating components, and the equipment is stopped with charged parts.

非受过培训的专业人员不可以进行以下操作：

Non trained professionals can not carry out the following operations:

—— 运输

- Transport

—— 储存

- storage

—— 安装/装配

Installation / assembly

—— 使用

- use

—— 维护保养

Maintenance

进行这些操作之前，请仔细阅读以下文件资料：

Before doing these operations, please read the following documents carefully:

—— 本手册的附图

The accompanying drawings of this handbook

—— 其他随机文件

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- other random files

— 设备标志牌

Equipment sign

— 有关设备的特别规定要求

Special requirements for equipment

— 有关安全和事故防范的国家/地方性规定

National / local regulations on safety and accident prevention

以下情形会导致严重人身伤害和物资损失:

The following can lead to serious personal injury and material loss:

— 不正确的搬运

- incorrect transport

— 不正确的安装

- incorrect installation

— 使用或操作不正确

- incorrect operation

— 擅自拆除必要的安全防护装置

Dismantling the necessary safety protection devices without authorization

2.1 运输与储存 Transport and storage

— 确认运输过程中的产品防护，在收货之后请立即检查包装箱是否完好，若有损坏请立即 通知运输单位和本公司，此为产品运输过程索赔的前提。

Confirm the product protection during transportation. Please check the packing box immediately after receiving the goods. If there is any damage, please inform the transport company and our company immediately. This is the premise of claim for product transportation process.

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—— 请严格遵守有关产品搬运的说明，否则可能导致人身伤害或设备损坏。

Please strictly observe the description of the transportation of the product, otherwise it may cause personal injury or damage to the equipment.

—— 设备长期存放请按照本手册中设备“长期存放”的规定。

For long-term storage of equipment, please follow the provisions of "long-term storage" of the equipment in this manual.

2.2 安装与调试 Install and debug

—— 请仔细阅读本手册中有关设备安装的说明。

Please read the instructions on the installation of the equipment carefully in this manual.

—— 本设备的安装与调试应由本公司或本公司代理的专业人员进行，在上述人员未到达现场之前，请不要拆解包装箱，此为您有关产品索赔的前提之一。

The installation and commissioning of this equipment shall be carried out by our company or our professional agent. Please do not disassemble the packing box before the above persons have arrived.

This is one of the prerequisites for your claim for products.

—— 调试过程中出现任何不正常的现象（如振动、尖锐噪音、超范围的温升），应立即停机检查，直至找出原因并排除。

Any abnormal phenomena during the commissioning process, such as vibration, sharp noise, and over range Wen Sheng, should be checked immediately, until the cause is found out and eliminated.

2.3 使用与维护保养

Operation and maintenance

—— 设备使用过程中存在带电部件、旋转部件、直线往复运动部件、承压部件，请谨遵本手册的规定，以防使用过程中造成触电伤害或机械伤害。

There are live parts, rotating parts, straight reciprocating parts and negative pressure parts during the operation of the equipment. Please obey the manual's regulations, and avoid to cause the electrical

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injury or mechanical damage during use.

— 设备运行过程中出现任何不正常的现象（如振动、尖锐噪音、超范围的温升），应立即 停机检查，直至找出原因并排除，必要时请与本公司联系。

Any abnormal phenomena during the operation of the equipment (such as vibration, sharp noise, and over range Wen Sheng) should be checked immediately, until the cause is found out and eliminated.

— 设备清洗过程可能涉及带电部件、化学液体或高温液体，请谨遵本手册的规定，以免造成触电、碰（砸）伤或跌落受伤。

If necessary, please contact with our company. The process of equipment cleaning may involve live parts, chemical liquids or high temperature liquids. Please comply with the requirements of this manual to avoid electric shock, collision or injury.

3 设备概述 Equipment Overview

3.0 概述 Overview

热风循环烘箱基本原理是利用蒸汽或电作为热能源，有蒸汽散热器或电加热元件产生 热量。利用风机进行对流换热，对物料进行热量传递，并不断补充新鲜空气和排出潮湿空气。干燥时间箱内能保持适当的相对温度和湿度，其最大特点是大部分热风在箱内进行循环，从而增强了传热和传质，节约了能源。该两大系列广泛适用于制药、化工、食品、轻工和重工业的原料和 产品的加热除湿。

The basic principle of a hot air circulation oven is to use steam or electricity as a heat source, with a steam radiator or an electric heating element to generate heat. Convective heat transfer is performed by a fan to transfer heat to the material and continuously replenish fresh air and discharge humid air. The proper relative temperature and humidity can be maintained inside the oven. The biggest feature is that most of the hot air is circulated inside the oven, which enhances heat and saves energy. These series hot air circulation oven are widely used for the raw materials and products in pharmaceutical, chemical, food, light industry and heavy industry.

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3.1 产品特点

Product features

3.1.1 结构特点 Structural characteristics

1. 大部分热风在箱内循环，热效率高，节约能源；

Most of the hot air circulates inside the oven, which has high thermal efficiency and saves energy;

2. 利用强制通风原理，箱内设有可调式分风板，物料干燥均匀。热源可采用蒸汽、热水、电、远红外广，选择广泛；

Using the principle of forced ventilation, the oven is equipped with an adjustable air distribution plate, and the material is evenly dried. The heat source can be widely used in steam, hot water, electricity, and far infrared;

3. 整机噪音小，运转平稳。温度自控，安装维修方便；

The whole machine has low noise and stable operation. Temperature control, easy installation and maintenance;

4. 适用范围广，可干燥各种物料，是通用型干燥设备；

Wide range of applications, it can dry a variety of materials, is a general-purpose drying equipment;

3.1.2 控制方法

Control way

- 普通控制（按钮控制）或 PLC 人机界面控制；

General control (button control) or PLC man-machine interface control;

- 温度控制；

Temperature control;

- 工作程式与工艺参数储存记忆及带打印功能（按客户要求）；

Work program and process parameters storage memory and printing function (according to customer requirements);

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3.1.3 加料方式:

Feed materials way

- 人工上料; Manual loading materials

3.1.4 清洗方式:

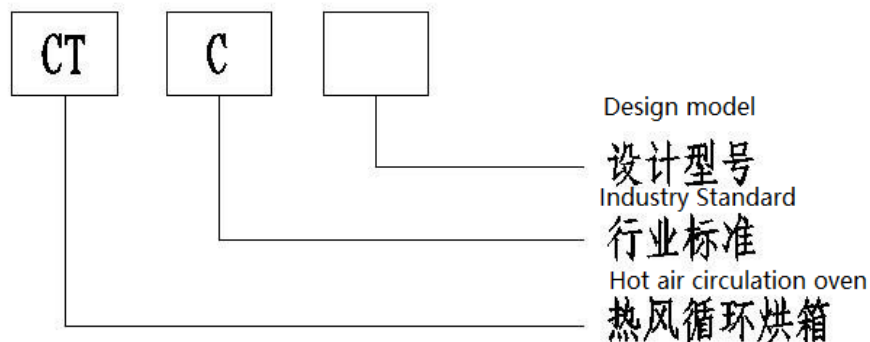
Cleaning way

- 人工清洗; Manual cleaning

3.2 产品规格型号及其意义 Product specification model and significance

本公司 CT 系列热风循环烘箱是系列产品的总称, 根据生产力不同具有多种规格。产品型号是按生产能力不同而编制, 其意义如下:

CT Series Hot Air Circulation Oven of Hywell company is the general name of a series of products, with various specifications according to the different productivity. The product model is prepared according to the different production capacity, and its significance is as follows



3.3 适用的环境和工作条件 Applicable environment and working conditions

3.3.1 工作环境 Work environment

- a) 环境温度: 正常工作环境空气温度在 5°C~40°C;

A) ambient temperature: the ambient air temperature of normal work is from 5 to 40.

- b) 湿度: 当环境温度为 40°C 时, 工作环境的相对湿度不超过 50%, 较低温下可允许较大湿度 (如环境

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温度为 20℃时，工作环境的相对湿度不超过 90%)。

B) humidity: when the ambient temperature is 40 degrees, the relative humidity of the working environment is not more than 50%, allowing for larger humidity at lower temperature (for example, when the ambient temperature is 20 degrees, the relative humidity of the working environment is no more than 90%).

c) 大气压强：86kpa~106kpa。

C) Atmospheric pressure: 86kpa to 106kpa.

3.3.2 工作条件 Working conditions

a) 电源条件：AC 380V/50Hz，特殊电源条件经系统配置变更后方可适用；

Power supply condition: AC 380V/50Hz, special power supply condition can be applied after system configuration change

c) 蒸汽：压力 0.2Mpa~0.8Mpa；烘箱内温度可达140℃，视企业可提供热源可使用蒸汽，

Steam: The pressure is 0.2Mpa~0.8Mpa; the temperature inside the oven can reach 140℃, depending on the steam source pressure that supply by user.

3.4 环境影响 Environmental impact

3.4.1 整机运行噪声小于 78dB(A),符合 GMP 的设备的要求；

The operation noise of the machine is less than 78dB (A), which meets the requirements of the equipment of the GMP.

3.4.2 清洗污液的排放请遵守国家和当地政府的相关规定；

3.4.3 the discharge of cleaning dirty liquid, please comply with the relevant regulations of the state and the local government;

3.5 设备报废 Equipment scrap

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设备经多年使用后将报废，报废物资的处理请遵守当地法律的规定。设备中有些部分可以回收其残值，如：

The equipment will be discarded after years of use, and the disposal of waste materials will comply with the provisions of the local law. Some parts of the device can reclaim their residual values, such as:

—— 机架、电机外壳、减速机外壳、齿轮、轴及轴承等碳素钢可作为废铁；

Carbon steel, such as rack, motor shell, reducer shell, gear, shaft and bearing, can be used as scrap iron.

—— 设备不锈钢件可作为废旧不锈钢；

The equipment stainless steel parts can be used as the waste stainless steel.

—— 电机线圈可作为废铜；

The motor can be used as a copper coil;

—— 其他塑料壳作为废旧塑料。

Other plastic shells are used as waste plastics.

4 结构特征与工作原理 Structural features and working principles

如图4-1，CT 系列热风循环烘箱系统，风机单元、加热单元、箱体、烘车、烘盘单元、进出 风高效过滤器及电气控制主要单元组成。

As shown in Figure 4-1, the CT series hot air circulation oven system consists of fan unit, heating unit, cabinet, drying unit, baking tray unit, inlet and outlet high-efficiency filter, and electrical control main unit.

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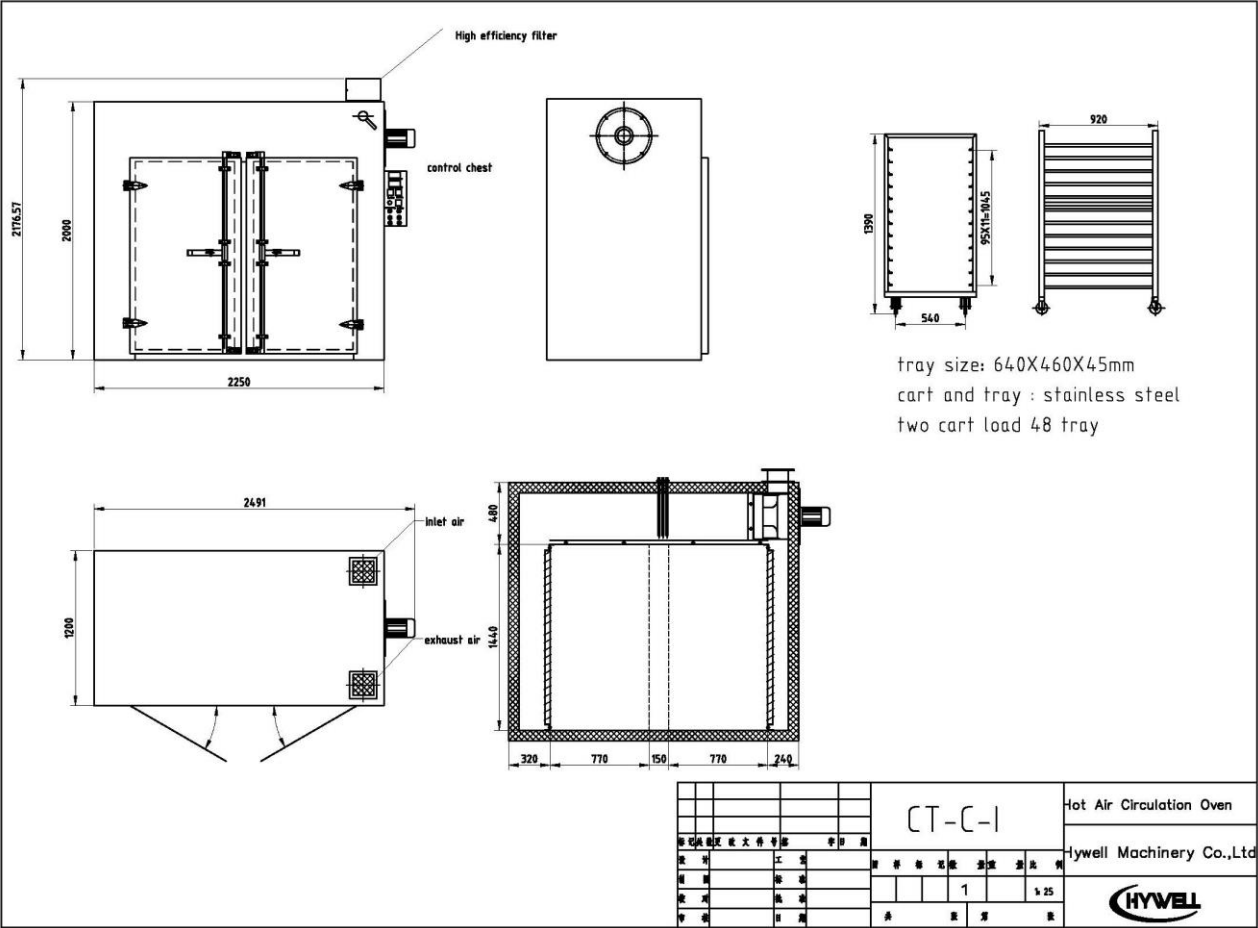


图 4-1 CT 热风循环烘箱总图

Figure 4-1 Hot air circulation oven general drawing

备注：本章中插图仅为阅读本手册的参考图例，是对器件清单的补充，使用中以实物为准。

Note: the illustrations in this chapter are only the reference illustrations for reading this manual. It is a supplement to the list of devices.

5 外形尺寸及主要技术参数：Overall dimension size and parameter

5.0 外形简图及主要尺寸（在这里只介绍一种型号尺寸(CT-C-I),具体请查看我公司样本）

Profile and main dimensions (here is only one type of size(CT-C-I), please see our company catalogue).

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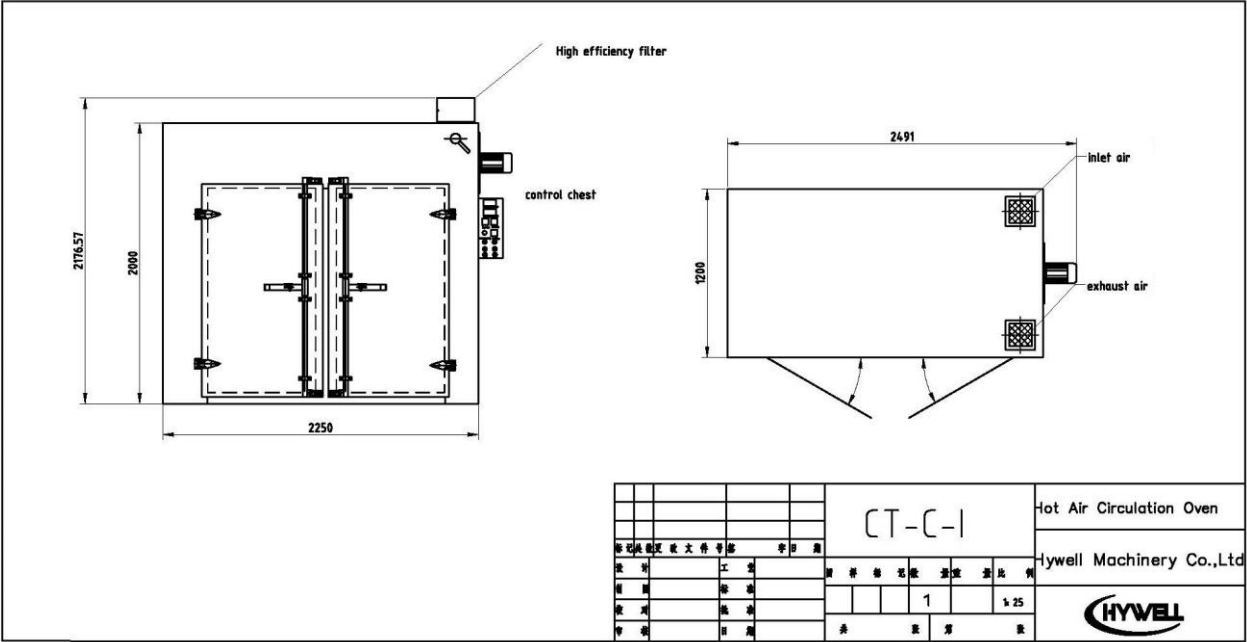


图 5-1 外形简图 Figure 5-1 Overall dimension



图 5-1 所示 CT 系列热风循环烘箱的设备外形与尺寸，其他规格产品见本公司产品样本。本公司可以按用户生产现场基建情况对设备的要求进行专门设计。Figure 5-1 shows the size of the equipment for CT Series Hot Air Circulation Oven. The products of the other specifications are found in the catalogue of the company. The company can make a special design on the requirements of the equipment according to the site construction of the user.

5.1 主要技术参数（表 5.1）Main technical parameters (table 5.1)

表 5.1 主要技术参数 Table 5.1 Main technical parameters

The main technical parameter of this machine are available for reference, we are produce and design product as peer customers' requirement.

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Industry standard	Specification standard	Drying weight per batch (Kg)	power (KW)	Steam consumption (Kg/h)	Evaporation area(m ²)	Air capacity (m ³ /h)	Temperature error	Baking plate	Overall dimension (L x W x H) mm	Baking cart (set)
RXH-7-D	CT-C-O	60	0.75	12	7.1	3450	±2	24	1400×1200×2000	1
RXH-14-D	CT-C-I	120	0.75	18	14.1	3450	±2	48	2300×1200×2000	2
RXH-27-D	CT-C-II	240	0.75x2	36	28.3	6900	±2	96	2300×2200×2000	4
RXH-41-D	CT-C-III	360	0.75x3	60	42.4	10350	±2	144	2300×2200×2000	6
RXH-54-D	CT-C-IV	480	0.75x4	80	56.5	13800	±2	192	4460×2200×2290	8
Mark	It also design and manufacture base customer require . welcome to contact us!									

6 安装与调试 Installation and debugging

	在主机的安装与调试时应小心谨慎，避免： ①从高处跌落！②触电！③禁止使用不完好和不匹配的工具！ ④非专业人员或未经培训合格 人员不得从事设备的安装与调试作业！ In the installation and debugging of the host, should be careful, avoid: (1) fall from the high! (2) electric shock! (3) prohibit the use of unfinished and mismatched tools! (4) Non professional personnel or untrained personnel shall not be engaged in installation and commissioning of equipment.
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6.0 设备安装 Equipment installation

6.0.1 设备吊装 Equipment lifting

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搬运吊装干燥机时，应用钢丝绳从设备顶部吊环穿入，并使钢丝绳均匀受力，以免发生倾倒。

When lifting the dryer, apply the wire rope from the lift ring of up of the machine and evenly force the wire rope to avoid tip overhaul.

6.0.2 主机部分安装（就地安装） Main machine installation

6.0.2.1 安装主机的地方应平整，其表面的平面度误差要求为 $\pm 2\text{mm}$ ；场地开阔，空间高度应便于主机安装。The place where the main unit is installed should be flat, and the flatness error of the surface should be $\pm 2\text{mm}$; the space should be wide and the space should be easy for the main unit to be installed.

6.0. 2.2 机身的校平 Leveling the fuselage

6.0. 2.2.1 用水平仪在两边立柱和机器正面进行检查，偏差应不超过 $\pm 2\text{mm}$,最后使用经纬仪校平

Check with the level on both sides of the column and the front of the machine, the deviation should not exceed $\pm 2\text{mm}$, and finally use the theodolite to level

6.0. 2.2.2 使用经纬仪对机身进行水平对齐操作

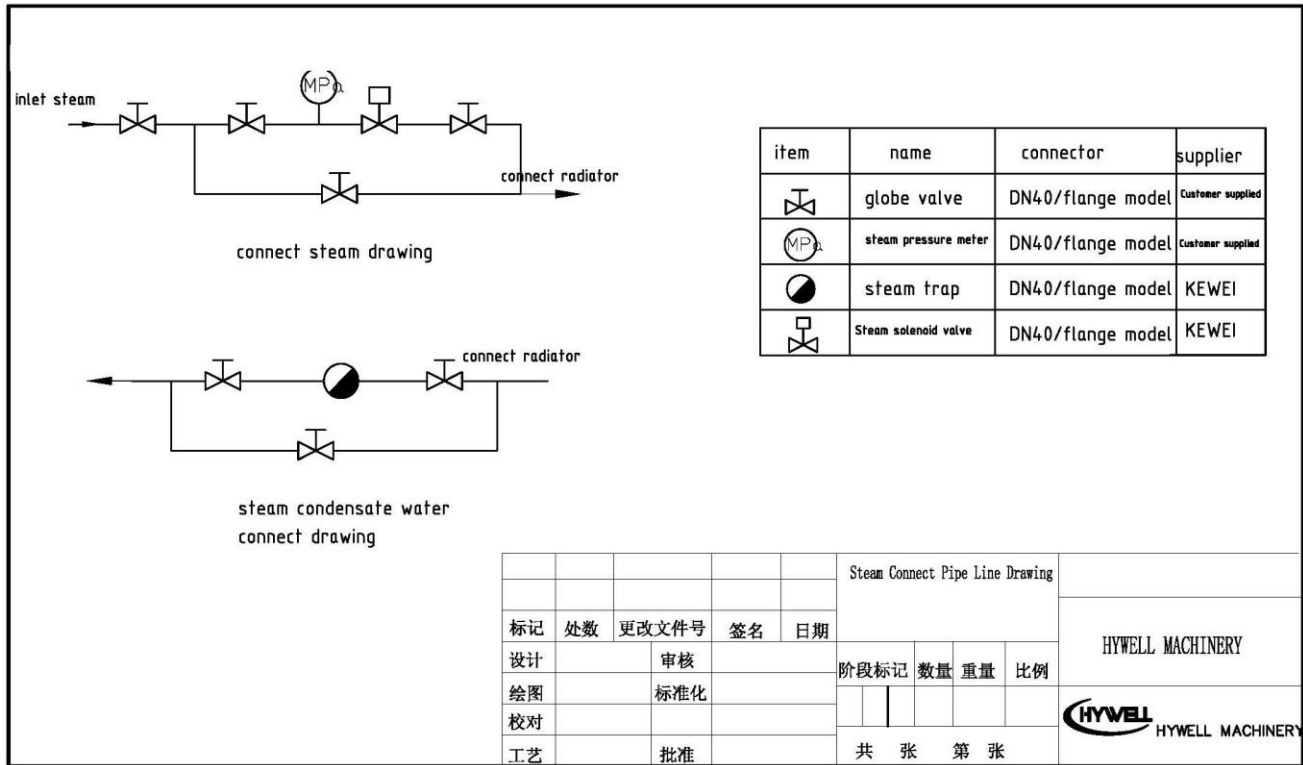
Horizontal alignment of the fuselage using the theodolite

6.1 管道安装 Pipe installation

根据蒸汽加热管道布置示意图如 6.1-1 (电加热无此项)

According to steam heating, the piping layout is as shown in drawing 6.1-1 (if the oven heating way is electrical, it have not this item)

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蒸汽加热，管道安装图（图 6.1-1）

Steam heating, pipe installation diagram (Figure 6.1-1)

6.2 设备调试 Debugging

	调试状态所有安全保护措施完全被屏蔽，非业人员不得进行调试作业！
	All the safety measures in the debugging state are completely shielded, and the non professional workers are not allowed to carry out the debugging operation.

6.2.1 调试前检查 Pre check for debugging

表 6.2 调试（整）前检查项目 Pre check for debugging

检查项目 checking item	要求 requirement	方法 checking way
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系统接地 grounding of system	接地和保护接地电阻不大于 4Ω Grounding and protection grounding resistance is not more than 4 Omega	以欧姆表检测 Detection by Ohmmeter
各安装联接 Installation joins	牢固可靠 Firm and reliable	以工具测试 Tool test
接通电源 Connect to power	380±10V/50Hz (follow the electrical drawing)	由专业人员进行 Do it by professional staff
接通蒸汽（热水或电加热） Switch on steam (hot water or electric heating)	符合要求 Meet the requirements	
设备工作区域 Equipment working area	无影响工作的杂物或无关人员 An unaffected or unrelated person.	

（一）本系列烘箱采用蒸汽加热器，导热油，热水，电加热及远红外电加热元件为热能 源，蒸汽加热器的最高工作压力为：0.8Mpa，禁止超压使用。

The hot air oven adopt steam heaters, heat conduct oil, hot water, electric heating and far infrared electric heating elements are heat energy sources. The maximum working pressure of steam heaters is 0.8Mpa, and overpressure is prohibited.

（二）若烘箱使用温度要求达到 120~140℃，即蒸汽压力应在 0.4~0.8 Mpa 范围内。若箱内温 度要求过到 80~120℃即蒸汽压力应在 0.2~0.4 Mpa 范围内。用电，远红 外加热，室温~250℃（超过 150 度。此设备需要非标设计）。(电加热无此项)

If the oven temperature requirement is 120~140℃, the steam pressure should be in the range of 0.4~0.8 Mpa. If the temperature inside the box is required to be 80~120℃, the steam pressure should be in the range of 0.2~0.4 Mpa. Use electricity, far red outside heating, room temperature ~ 250 ° C (the working temperature is more than 150 degrees. This equipment needs non-standard design). (if the oven heating way is electrical, it have not this item)

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（三）本系列烘箱要求三相四线制 380V/220V 电源。

This series of ovens requires a three-phase four-wire 380V/220V power supply.

（四）远红外电加热元件电源电压采用 380V 和 220V。

The far-infrared electric heating element power supply voltage is 380V and 220V.

（五）接通风机电源后启动风机开关，视风机转向应和标记方向符号一致。

After turning on the fan power supply, start the fan switch, and the fan rotation should be in the same direction as the marking direction.

（六）烘箱蒸汽管道与供汽管道接通后，烘箱使用时首先必须打开疏水器旁通阀门，排放管道内可能残留的杂物及冷凝水，以保疏水器能正常工作。由于管道中有残留物，电磁阀和疏水器 初用时如发现失灵，必须拆下清洗，待管道内清净后，才能保持正常运行（电加热无此项）。

After the oven radiator pipe and the steam supply pipe are connected, firstly the oven must open the steam trap bypass valve to discharge the condensed water to ensure that the steam trap can work normally. Due to the residue in the pipeline, if the solenoid valve and the steam trap are malfunctioning at the beginning, it must be removed and cleaned, and the pipeline must be cleaned before it can maintain normal operation (if the oven heating way is electrical, it have not this item).

（七）烘箱内左右两侧的百叶窗在调正叶片角度时，尽量使热风流通面积大。请注意最下部两张叶片不要打开，从第三张开始向上，其叶片开启角度应逐渐增大，因百叶窗时片调正正确与否，影响箱内温度均匀性。

When the blinds (adjusting air plate) on the left and right sides of the oven are adjusted to the angle of the blade, try to make the hot air flow area large. and the lowermost two blades not to open. From the third sheet, the blade opening angle should be gradually increased. If the louver is correct or not, it will affect the temperature uniform inside the box.

（八）烘箱内温差调正的方法：在烘箱内上、中、下位置放留点温度计，其安放位置顶板向下 200 毫米毫米为上面测温点，底板向上 200 为下面测温点，其中点位置在中心位置测温点。关上烘门，打开蒸汽阀门和启动风机进行升温循环，约 30 分钟后取出温度计，观察中、上、下三点读数是否在允许范围内，

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如温差较大，则温度高的部位其对应的叶片角度相应开小，相反，温度低的部位其叶片角度相应开大一点，直至调整到上下温差基本相似，经调整后的百叶窗，在没有产生设备变动移位的情况下，则不需要再进行调正。

Method of adjusting the temperature uniform inside the oven: Place the thermometer in the upper, middle and lower positions of the oven. and place the thermometer at the 200mm downward from top plate for the above temperature measurement point, and place the thermometer at the 200mm upward from bottom plate for lower temperature measurement point, middle temperature measurement point position is at the center position. Close the drying door, turn on the steam valve and start the fan to carry out the heating cycle. After about 30 minutes, take out the thermometer and observe whether the readings of the middle, upper and lower points are within the allowable range. If the temperature difference is large, the corresponding blade of the temperature is high. The angle is correspondingly small. On the contrary, the blade angle is correspondingly larger when the temperature is lower, until the upper and lower temperature differences are basically similar. The adjusted louver does not need to be adjusted again without changing the displacement. .

（九）烘箱上的排湿机构是用来排除箱内潮湿空气的，打开排湿装置是根据烘箱温度升到你所需要的设定值后，即手动打开排湿阀门进行排湿，但排湿阀中的开启角度不能太大，一般排湿量要根据物料含有的水分量来进行。

The dehumidification device on the oven is used to remove the humid air inside the oven. The dehumidification device can be turn on by manual after the drying temperature is raised to the desired setting temperature, the dehumidification valve is manually opened for dehumidification, but the dehumidification valve opening angle should not be too large, and the general moisture discharge amount should be based on the moisture content of the material.

（十）整体运输进行安装的，由于运输过程中各部件有移位现象。使用前必须对部件进行调正，以保证烘箱的使用效果。

Installation of the machine that is whole transportation, due to the displacement of various

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components during transportation. The parts must be adjusted before use to ensure the use of the oven.

6.2.3 电气系统调试 Electrical system debugging

急停开关可靠性与传感器有效性调试 Emergency stop switch reliability and sensor effectiveness debugging

急停开关（用于紧急情况停机。）放开急停开关，将电源开关（钥匙开关）设置 ON 的位置。按下急停开关，看急停开关及其线路是否有效，否则应予纠正。

Emergency stop switch (for emergency shutdown.) Release the emergency switch and set the power switch (key switch) to the position of the ON. Press the stop switch to see the stop switch and wire line are valid, otherwise it should be corrected.

6.2.4 系统调试 System debugging

风机转向调试 Fan steering commissioning

风机是指轴流风机，正常工作时风量是逆时针运行。调试时在手动操作界面点动风机启动键，观察风机转向是否正确，否则应将风机电源线中任意两项对调。

The fan is an axial fan, and the air volume is counterclockwise during normal operation. When debugging, click the fan start button on the manual operation interface to observe whether the fan steering is correct. Otherwise, any two of the fan power cables should be reversed.

系统调试推入烘车，复原急停开关，接通电源，接入蒸汽，手动操作进行系统调试，设备系统动作与指令完全符合。

System commissioning: pushed into the drying car, the emergency stop switch is restored, the power is turned on, the steam is connected or electrical heater is connected, the system debugging is performed according to the manual operation, and the device system action and the instruction are completely in accordance.

6.2.5 空载运行 No-load operation

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电气系统调试完成后，应进行空载运行，空载运行时间不少于 30 分钟。空载运行中要求注意力臂的运转是否正常有无异常声音！按本手册第 7 章《设备使用操作》说明进行。

After the electrical system is completed, the no-load running should be carried out, and the running time is not less than 30 minutes. In the unloaded operation, it is required that the operation of the arm is normal or not. According to the seventh chapter of this manual, the operation of the equipment is explained.

检查整机运行状况，如有不平稳或异常响声等不正常情况，应立即向车间汇报，排除故障后方可投入生产。

Check the operation condition of the whole machine, if there are abnormal conditions such as unstable or abnormal sound, it should report to the workshop immediately, and it can be put into production after the troubleshooting.

6.3 安装调试后的验收试验项目，方法和判据 Acceptance test items after installation and commissioning

表 6.2 验收试验项目，方法和判据 Test way

项目 Item	要求 Requirement	试验方法 Testing way	备注 Mark
概况 Survey	符合工程设计要求 Meet the requirements of design	对照工程设计图 Compare the design drawing	
平度 Flatness	$\leq 1.5/1000$	仪框水平仪 Frame level instrument	
电源 Power	接入相序正确 Access phase sequence correct		
电气系统 electrical system	接地电阻不大于 4Ω The grounding resistance is not more than 4Ω	用万能表检测 Use the universal meter to detect	
	急停开关有效，可靠 emergency stop switch is effective	目测 check by eye	
	传感器有效，可靠 Temperature sensor is	手动，目测 Manual, check by eye	

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	effectibe		
空载试验 No load running	运行是否流畅,有无异声 running smoothly	感官 listen	
现场整理 Field arrangement	现 场 杂 物 清 理 干 净 Clean up the sundries on the spot	目测 check by eye	

7 设备使用操作 Equipment operation

	本设备不适用易燃易爆物料或能产生易燃易爆气体的物料；也不适用对于干燥过程中产生的静电会产生燃烧、爆炸、变性等有害于人身、设备、经济安全的物料使用。This equipment is not suitable for flammable and explosive materials or materials that can produce flammable and explosive gases. It is also not suitable for the use of static electricity generated during the drying process, which may cause burning, explosion, denaturation and other materials harmful to the human body, equipment and economy.
	本章罗列了 CT 系列热风循环烘箱全部功能的操作，具体设备可能只适用其中的部分。本章列举的屏幕菜单可能与具体设备实际存在不一致，适用时请以实际为准。为了维持设备正常的工作效率和适用寿命，建议按 8 小时/班的工作频度使用设备。This chapter lists all the functions of the CT Series Hot Air Circulation Oven, and the specific of equipment may only apply to the parts. The screen menu listed in this chapter may not be in accordance with the actual equipment. In order to maintain the normal working efficiency and life span of the equipment, it is suggested that the equipment should be used in the frequency of 8 hours per shift.

本手册中的操作说明可作为编制设备操作规程的参考性文件。The operation instructions in this manual may be used as a reference document for the preparation of the operating procedures of the equipment.

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7.0 操作规程 Operating Procedures

7.1 设备启动前的检查与准备 Check before starting

检查项目 checking item	要求 requirement	方法 checking way
接通电源 Connect to power	380±10V/50Hz (follow the electrical drawing)	复位急停开关，将上钥匙开关旋至ON 位置
疏水器 Steam trap	使用之前打开排放污水 Open the discharged sewage before use	检查是否损坏（对于蒸汽加热） Check for damage (for steam heating)
接通蒸汽（热水或电加热） Switch on steam (hot water or electric heating)	符合要求 Meet the requirements	
物料 Materials	放入烘车并推入到位 Load inside cart and put inside oven	
设备工作区域 Equipment working area	无影响工作的杂物或无关人员 An unaffected or unrelated person	

7.2 设备启动及使用操作程序，方法 Device startup and operation procedures, methods

7.2.1 开机 Start machine

将电源开关旋转至 ON 键，将急停开关复位，此时电源指示灯变亮，表明开启电源成功，电源已接入系统。

Rotate the power switch to the ON button to reset the emergency stop switch. At this time, the power indicator lights up, indicating that the power is turned on successfully and the power is connected to the system.

7.2.2 上料将物料先放入烘盘中，然后将烘盘放入烘车上，将推车推入烘箱。

Feeding the material into the baking tray, then placing the baking tray on the drying cart and pushing

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the cart into the oven.

7.2.3 操作 Operation

设定进风温度，加热时间（选择性）等参数设定，点击风机启动，加热启动（电加热，蒸汽阀），此时手动作业中干燥作业开始。干燥完毕后，关闭加热（蒸汽或者电），根据客户要求确定是否运行吹冷物料而延迟关闭风机。停止风机出料。结束后可进行人工清洗。

Set the inlet air temperature, heating time (selectivity), click the fan start, heating start (electric heating, steam valve), at this time the drying operation starts in the manual operation. After drying, turn off the heating (steam or electricity) and determine whether to run fan to the blown material temperature and delay the fan shutdown according to customer requirements. Stop the exhaust fan. Manual cleaning can be done after the end.

8 故障的分析与排除 Analysis and elimination of faults

设备的大多数故障会在屏幕上端及时消息栏中显示出来（触摸屏控制有此功能），以便于操作和维护人员采取相应措施。出现故障时，系统所有运行会被立即中止，工作人员应及时进行故障分析排除。

Most of the failures of the device will be displayed in on the control panel to facilitate the operation and maintenance personnel to take appropriate measures (touch screen control have this function). When the fault occurs, all the system runs will be stopped immediately, and the staff should do the fault analysis and troubleshooting in time.

常见故障现象，原因分析及排除方法见表 8.1

Common failure phenomenon, reason analysis and elimination method see table 8.1

8.1 故障及排除 Failure and elimination

所有设备故障应由专业人员检修，故障排除后应进行确认

All equipment failures should be overhauled by professional personnel and should be confirmed after troubleshooting

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故障现象 Failure phenomenon	可能原因 Reason	排除办法 Elimination method
1、温度升不高 Temperture is lower	1、蒸汽压力太低 Steam pressure is lower 2、疏水器失灵 Steam trap have problem 3、电加热电压太低 Electrical heater voltage is lower 4、排湿阀处常开状态 Moisture discharging valve is turn on 5、风机转向不符 Fan rotation way is not right 6、显示仪表不正确 Temperature gaugle have problem	按要求提高蒸汽压力 Raise the steam pressure 疏水器有杂物阻塞 Check the steam trap 提高网路电压，按要求供电 Check the electrical power 关闭排湿阀 Turn off the moisture dischagring valve 电源线两相任意对调 Adjust the exhaust fan wire connection 检查热电阻是否固定良好，接线是否正确必要 时用标准电阻箱校验温度仪 Check the sensor connecting wire
2、箱内温度不均匀 temperature uniform is not good inside the oven	1、百叶窗叶片调正不当 blind adjust is not good 2、烘门未关严 door is not all close	按第六条进行调正检查并排除 adjust the blind base the item 6.2.1 item 8
3、风机噪音大 fan have big noise	1、风机或电机螺栓松动 Fan or motor bolt is lose 2、风机叶片碰壳，轴承磨损 Fan blade hits the shell, bearing wear	检查并排除 Check and Troubleshoot the problem 检查并排除 检查线路及电器开关 Check and eliminate Check wiring and electrical switch

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4、干燥速度太慢 Drying speed is too slowly	1、箱内温度太低 temperature is too lower	见故障 1 see the fault 1 调整排湿阀开度 adjust the moisture valve
	2、排湿选择不当 moisture discharging valve is improper	检查风机，风管有否漏风和叶片杂物吸上 check the fan and air pipe
	3、风量太小 air volume is too small	

8.2 设备易损件明细表 vulenrable part list

名称 Name	用途 Usage	备注 Mark	数量 Qty	名称 Name
1	轴流风机 fan		304/AL	380V
2	门铰链 door hinge	10"	不锈钢 stainless steel	
3	烘车轮脚 cart wheel		304	
4	电加热管 electrical heater		304	380V
5	测温热电阻 temperature sensor	PT100		
6	疏水器 steam trap	DN20		
7	蒸汽阀 steam valve	DN20	不锈钢 stainless steel	

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8	烘门密封条 gasket of door	橡胶 rubber		
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9 维护及保养 Maintenance



在进行设备的维护和保养之前，必须保证电源都被断开。

Before the maintenance the equipment, it is necessary to ensure that the power supply is disconnected.

9.0 概述 Summary



本部分所包括的内容是为确保人员和设备安全和有效操作所必须进行的预防性维护程序。

The contents of this section are preventive maintenance procedures that must be carried out to ensure the safety and effective operation of personnel and equipment.



执行维护工作的人只能是称职的工程技术人員或已经接受过此设备维护培训的人员。

The person who performs the maintenance work can only be a competent engineering technician or a person who has already received the maintenance and training of the equipment.



进行设备维护保养之前，必须保证电源与本机阻隔断开。

Before the maintenance of the equipment, it is necessary to ensure that the power supply is separated from the machine.

维护的目的是保证该机始终处于完好运动状态。维护分日常维护和周期维护。

The purpose of maintenance is to ensure that the machine is always in good condition. Maintenance of daily maintenance and cycle maintenance.

9.1 日常维护：Daily maintenance

1.定期检查机件，每月进行 1~2 次，检查项目为轴承、皮带、活动盘、固定盘等各活动部位是否转动灵活和它们的磨损情况，发现缺陷应及时修复使用。

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Regularly check the machine parts for 1~2 times per month. Check the parts such as bearing, belt, movable disk, fixed disk and so on are flexible and their wear conditions, and find the defects and repaired in time.

2. 轴承处充填 2#锂基润滑脂，每隔 3 个月检查补充一次；

The bearing is filled with 2# lithium base grease, and it is checked and supplemented once every 3 months.

3. 电器零件应保持清洁、灵敏，发现故障应及时修复。

The electrical parts should be keep clean and sensitive, and the fault should be repaired in time.

4. 本机视操作运转半年应检查修理一次，检查时应按原位置装配并调整各部位间距和公差.

This machine should be inspected and repaired once according to the operation for half a year. When checking, it should be assembled according to the original position and adjust the spacing and tolerance of each part.

9.2 周期维护：Periodic maintenance:

一年小修一次，二年大修一次。A minor maintenance for one time for one year, two years for an overhaul.

10 设备的搬运与储存 Handling and storage of equipment



开始安装前应保证起重设备是适当的，这些装置应具有有效的测试证书；

Before the installation, it is necessary to ensure that the lifting equipment is appropriate and that these devices should have effective test certificates.

请勿使用带绞合缆绳，受损绳缆或打结缆绳进行起重作业；

Do not use stranded cable, damaged rope cable or knot cable for lifting operation.

禁止使用不完好和不匹配的工具

Prohibition of the use unfinished and mismatched tools

10.0 包装 Package

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出厂前对设备进行部分拆解分箱包装。

Before leaving from the factory, the equipment is partially disassembled and packed in the sub box.

主机及其拆解部件以木箱进行包装。在不可倒置，侧放的包装箱上，已作好明确标识。

The main machine and its disassembly parts are packed in wooden cases. It is clearly marked on the side packed box.

10.1 搬运 Carry

搬运时应符合起重要求的起吊装置进行搬运。搬运中不得使用带绞合缆绳，受损缆绳或打结缆绳，缆绳与设备除吊环外的其他部位接触应以橡胶，棉布等柔软物加以区隔，以免损伤设备。

The lifting device should be handled in accordance with the lifting requirement. It is not allowed to use stranded cables, damaged cables or knotting cables. Cables and equipment should be separated from other parts except rings, so that rubber and cotton fabrics can be separated from each other so as to avoid damage to the equipment.

10.2 运输 Transport

本设备适宜陆运和海运。

This equipment is suitable for land transportation and sea transportation.

陆运时装车应注意包装箱上的标志，除基座外，其余部件要求包装箱不得倒置，侧放和倾斜过多。装车时还应采取适当的防护措施，以避免设备在运输过程中受潮，受振和受冲击。

It should pay attention to the logo on the packing box when load the land transport truck. Except for the base seat, the other parts require that the packing box should not be inverted, the side and the tilt are too

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much. Appropriate protective measures should also be taken to avoid the dampness, vibration and impact of the equipment during the transportation.

10.3 贮存 Storage

设备应贮存于干燥，通风，无腐蚀性介质，无振动的室内。

The equipment should be stored in dry, ventilated, non corrosive medium and no vibrating room.

11 开箱机检查 Opening box inspection

11.0 开箱注意事项 Precautions for opening the box

a) 开箱前应仔细检查包装是否完好，件数，名称规格与运单是否一致

a) before the box is open, it should be carefully examined whether the package is intact; whether the number, the name ,the model is same as the waybill.

b) 开箱时应拆除包装箱顶盖，然后打开四侧，取出设备。

B) when the box is open, the top of the box should be dismantled. Then the four side should be opened and the equipment is removed.

11.1 检查内容 Inspection content

a)随机文件（一般包括：装箱单，合格证书，使用说明书，检验报告，随机附件清单等）；

a) Random files (generally included: packing list, certificate of qualification, manual book, inspection

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report, random appendix list, etc.);

b)根据装箱上记载的内容逐件核对查验，并作好记录。

b) Check one by one according to the contents recorded on the packing, and make good records.

附录一： 电气图 Appendix 1 Electrical drawing

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Thank you for using the CT Series Hot Air Circulation Oven produced by Hywell company. Please read the instructions carefully before installing and using!
