KX-C新型霓虹灯制作设备使用

KX-B New-typed neon bulb fabricate equipment usage

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**明**

**书**

Specification

**单位**:北京中科帅虹霓虹电器厂

Beijing Zhongke Shuaihong neon electric appliance factory

**地址：**（办）中国北京市中关村高科技园区二拨子工业区16号

（厂）中国北京市昌平区回龙观二拨子新村龙兴园西区13-1-102（102208）

**Tel**: 086-10-51090091 51090092 81619378 13910218696 13488820069

**Fax**:086-10-51090092 QQ:653024350

**E-mail**: wjs@neonnews.com or neonnews@163.com

**Http**: [www.neonnews.com](http://www.neonnews.com/) or www. ZKVAC.cn

**Address**：（office）China Beijing Zhongguancun high－tech district Erbozi industry district No.16

（factory）China Beijing Changping district Huilongguan Erbozi New village Longxin park West district 13－1－102（102208）

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一. 前言:

 首先感谢您购买我单位的霓虹灯系列产品,我能为您服务感到很高兴.在使用本产品前请认真阅读此说明书,它将对您的使用提供帮助.

First of all, thank you for purchasing our neon bulb series of product, I am very happy to serve you. Read the specification carefully before you use the product, and it will supply a lot of help for your usage.

 北京中科帅虹霓虹电器厂是霓虹灯行业的一家高新技术企业、是中国照明学会霓虹技术专业委员委员单位、北京霓虹灯专业委员会理事单位、《中国霓虹灯信息网》和《中国霓虹》的主办单位，主要以培训霓虹灯制作技术，生产新型霓虹灯制作设备和霓虹灯管成型机，销售霓虹灯器材和制作霓虹灯工程。

 Beijing Zhongke Shuaihong neon electric appliances factory is one of high-tech enterprises in the neon trade, is the commissary unit of China lighting academy's neon technology professional committee, is the council unit of Beijing neon professional committee, is the sponsor of 《www.neonnews.com》and 《www.neon.org.cn》.We pay attention to training of neon's fabricating technology, producing new types of neon fabricate equipment and neon administer molding machine, selling neon equipment and fabricating neon's craft's lamp.

其制作的霓虹灯设备有金属和玻璃；有手动和自动；有低真空和高真空；有国产和进口；有简易和复杂；有排充气设备和做直管设备，是目前国内生产霓虹灯设备档次最高，品种最全，价格最优惠，制作霓虹灯设备最专业的霓虹灯设备制造商。现霓虹灯设备普及全国，并远销美国、俄罗斯、叙利亚、哈萨克斯坦、乌兹别斯坦、吉尔吉斯坦、台湾、阿尔吉利亚、澳大利亚、裴济等国家和地区，受到广大客户和国际友人的普遍赞誉和好评。

The neon equipment what we make is metal and glass, manual and automatic, low vacuum and high vacuum, homemade and importation, simple and complex, the exhaust and charge equipment and the straight pipe equipment. And we are the most professional equipment manufacturers, who can be able to make neon equipments that have the highest scale, the most complete breed and the most favorable price. Now our neon equipments have popularized all over China and are sold to the distant places such as America, Russia, Syria, Kazakhstan, Crow Tzu not Stein, Kirghizia frank, Taiwan, Algy's Leah, Australia, pei ji and so on and have received the recognition and favorable comment from our customers and international friends.

我们可以协助办理报关，包装，运输等进出口业务，具体费用另行协商。

We can assist you to do the declaration, package, shipment and import and export business. The specific charges can be negotiated additionally.

一． 用途：

本设备专为制作高品质霓虹灯，冷阴极灯，工艺灯等而设计，具有低高真空配置，真空仪表指示，温度监控，充气等全面功能。除用于上述灯具外，也可用于其它类型的电真空，电光源的制作。

 Purpose:

The equipment is designed specially for fabricating high-quality neon bulb, cold cathode lamp, craft lamp, possessing the overall function as low fine vacuum configuration, vacuum instrument designation, temperature monitor and control, charge. Besides, it can also be used for the fabrication of the other type of electric vacuum and electric lamp.

二． 产品技术性能：

该设备设计独特，系统采用全金属化结构，真空管路采用无磁不锈钢，阀门采用手动控制，真空仪表采用先进的指针式，灯管的温度由先进温度计及时检测，配有高纯度钢瓶气体，并配有四个工位阀，可同时排四支灯管，提高工作效率，同时还能防止汞被抽入系统造成污染。全套设备具有技术先进，设计合理，操作方便，质量稳定等特点。

该设备技术指标如下：

a) 系统极限真空0。00005毫米汞柱，抽速300升/秒,

b) 真空泵极限真空0。06帕，抽速4升/秒

c) 扩散泵极限真空0。00005帕，抽速300升/秒

d) 电阻真空计测量范围0。1至100000帕

e) 温度计测量范围1至400度

f) 电量：220伏，2000瓦。

g) 设备重量180公斤

h) 外型尺寸：900mm（长）+550mm（宽）+1000mm（高）

The technological performance of the product

The equipment is designed uniquely and adopt whole metallization structure systematically, the vacuum pipeline adopts non-magnet stainless steel, the valve adopts hand-operated control. The vacuum instrument adopts the style of advanced finger. The temperature of the light pipe is detected by advanced thermometer in time, with high-purity cylinder gas, and with four location valves. It can arrange four light pipes at the same time, and enhance efficiency. It can also prevent absorbing the mercury into the system resulting pollution. The complete set has the character of advanced technology, reasonable design, easy operation, and stable quality.

The technological quota of this equipment is as follows:

a) Systematic limit vacuum is 0.00005 millimeter column of mercury, the drawing speed is 300 liter/ Second,

b) Vacuum pump limit vacuum is 0.06 Pascal, The drawing speed is 4 liter/ Second

c) Diffusion pump limit vacuum is 0.00005Pascal, The drawing speed is 300 liter/ Second

d) Resistance vacuum gage's measurement range is from 0.1 to 100000Pascal.

e) Thermometer's measurement range is from one to 400

f) Quantity of electricity: 220v, 2000 watt.

g) The weight of Equipment is 180 kilogram

h) External size: 900mm (length) +550mm (width) +1000mm (highness)

三． 结构说明

本机主要由排气，充气系统，真空检测，温度指示和电器控制等部分组成。

a) 排气系统：

1． 低真空系统：由真空泵，真空阀，防返油球，管路等组成。

2． 高真空系统：由真空泵，扩散泵，真空蝶阀，防返油球，管路等组成。正常工作时，由真空泵进行抽气，由真空阀进行控制，可实现系统的基础真空，即低真空；由真空泵，扩散泵进行抽气，由高真空蝶阀进行控制，可实现系统的高真空，从而为制作高质量霓虹灯提供有力保证。

3． 真空泵上方的防返油球，保证了真空泵工作停止后，少量的真空油不会流入真空系统，从而保证了真空系统的纯洁性，所以此机在关机时可以不用放气。

b) 充气系统：

充气系统由钢瓶气体，连接管道，针阀等组成。在制作霓虹灯需要充气时，可在全密闭系统内为系统提供高纯度惰性气体，以保证做出高质量的霓虹灯管。

Three. Structure explanation

The machine is mainly composed by prevent- returning mercury location valve, exhaust, charge system, vacuum detection, temperature designation and electric appliances control part ect.

a) Exhaust system:

1. Coarse vacuum system: By vacuum air pump, vacuum valve, prevent return oil's ball, pipeline composing.

2. High vacuum system: Be composed by vacuum pump, diffusion pump, vacuum valve, , prevent return oil ball, pipeline. When it works regularly, the vacuum pump will draw gas and the vacuum valve will control to achieve the basic vacuum, that is coarse vacuum. When dras gas with vacuum pump and diffusion pump, and control with high vacuum reed valve, it can achieve systematic high vacuum, and then supply powerful guarantee for fabricating high-quality neon bulb.

3. The prevent-return oil ball above the vacuum pump ensures small amount of vacuum oil will not flow into the vacuum system after the vacuum pump stops working to ensure the pureness of the vacuum system. Therefore, the machine needn't set free the gas when turn off the machine.

b) Charge system:

The charge system is composed by cylinder gas, connect pipe, reed valve ect. When it need to charge tat the process of fabricating neon bulb, it can supply fine-pure inactive gas for system inside the tightly closed system to ensure to make the high quality neon bulbs.

四． 安装与调试

a) 启动设备前，请先详细阅读本说明书，并检查主机和附件是否完整齐全。

b) 设备应放在清洁而干燥的室内。室内须有220伏功率2千瓦以上的电源，循环水和良好的接地装置。

c) 安装调试步骤如下：

1． 将灯管工作台安装好，轰击变压器放在远离工作台的安全位置，接好高压线，轰击变压器的控制线应和设备上面的控制板进行对应连接。

2． 设备的后下方有地线引出头，通电前应先接好地线，并测量机壳暴露金属部分的任意一点与埋设地线间的电阻值不得大于0。1欧姆。

3． 分别接通总电源，气源和循环水。

d) 调试操作：

1． 旋转电源开关于开的位置，依次打开电阻计，温度计的电源。

2． 接通水源。

3． 打开真空泵，低真空开关，抽低真空，此时电阻计应在10帕以内。

4． 打开扩散泵，高真空开关，抽高真空，此时电阻计应在0。5帕以内。一般首次启动扩散泵应在20分钟左右的预热时间。

5． 充气实验：

关闭气瓶阀，打开低真空阀，针阀，分别打开氖气和氩气开关，将两管道分别抽到10帕以下，然后关闭低真空，打开高真空阀，将管道抽至高真空。关闭氖气阀，氩气阀和针阀，打开气瓶阀，大压力表应在5Mpa左右，小压力表应在0。3Mpa左右。关闭低高真空阀，打开氖气或氩气阀，观察仪表的回转速度，调整好针阀的开启量，即针阀的开启量决定了充气速度的快慢。应氖气或氩气阀多开关几次，掌握好充气速度。一般氖气10000-50000pa或氩气800-1000pa左右，此值为参考值，可根据实际情况进行调整。

e) 轰击放电加热实验：

将轰击变压器高压输出端接上灯管，打开相应的工位阀，抽低真空，夹上温度计传感器，待真空在10帕左右，关掉低真空，打开变压器开关，依次按7500伏，9000伏，12500伏，15000伏，并看相应的信号灯。

 上述安装调试过程全部完成，并无异常现象，即可投入生产。

A. Install and debug

a) Before starting up the equipment read the specification first, and check the main engine and its accessories are whether complete or not.

b) The equipment should be put in the clean and dry inside places. It should have above 220V and 2 kilowatt power supply, recycled water and good earthen devices.

c) Install and debug step is as follows:

1. Install the tub workbench, keep the bombardment transformer away from the workbench, meet the high tension line. The control line of the bombardment should be jointed correspondingly with the control board above the equipment.

2. The ground wire is out at the under behind place of the equipment. The ground wire should be contacted well before setting up an electric circuit and measure the arbitrary metal parts revealed outside the machine and the electric resistance of the underground wires can't be more than 0.1 ohm.

3. Put through the general electric power, the gas source and recycled water respectively.

d) Debug operation:

1. Close down the four location valves, revolve the switch of the electric power to make it on, then open the power of the electric resistance gage, and thermometer in turn.

2. Put through water source.

3. Open vacuum pump, coarse vacuum's switch, draw coarse vacuum, the electric resistance gage should be within 10 Pa.

4. Open the diffusion pump, fine vacuum switch, draw fine vacuum; the electric resistance gage should be within 0.5 Pa. Ordinarily, the first heating time to start up the diffusion pump should be at about 20 minutes.

5. Charge experience:

Close the gas cylinder valve, open coarse vacuum valve, reed valve. Open the switch of neon gas and argon gas respectively, draw the two pipes under 10Pa respectively, then close the coarse vacuum, open high vacuum valve, to draw pipe into fine vacuum. Close neon gas valve, argon gas valve and reed valve, open gas cylinder valve, the big manometer should be at about 5Mpa, and the small manometer should be at about 0.3Mpa. Close the low high vacuum valve, open neon gas or argon gas valve, observe the speed of the rotation velocity of the instrument, and adjust the open quantity of the reed valve well. That is: the open quantity of the reed valve decides the speed of the charge. The switch of the neon gas or argon gas valve should be open and down for several times to control the speed of the charge. Ordinarily, neon gas is10000-50000pa or argon gas is about 800-1000pa, the number us just for reference value, you can do adjustment according to actuality proceed.

e) Bombardment discharge heating experience:

Let the high pressure export hold of the bombardment transformer meet the light tube, open the corresponding location valve, draw coarse vacuum, nip on thermometer sensor, turn off the coarse vacuum when the vacuum is at about 10Pa, open the switch of the transformer 7500V, 9000V, 12500V, and 15000V in turn, and look the corresponding signal lamp.

 After finishing all the above install and debug operation processing and does not find abnormal phenomenon, then it can be put into work.

五． 使用方法：

a) 接通水源。

b) 将灯管直接插入真空胶管或焊在相应的玻璃管上。

c) 旋转电源开关于开的位置，依次打开电阻计，温度计的电源。

d) 打开真空泵，低真空开关，抽低真空，此时电阻计应在10帕以内.

e) 将轰击变压器高压输出端接上灯管，夹上温度计传感器，待真空在10帕左右，关掉低真空，打开变压器开关，依次按7500伏，9000伏，12500伏，15000伏，并看相应的信号灯。此时应根据灯管的长短，粗细，选择相应轰击档位，灯管的长短粗细应和轰击电压成正比。灯管内的气压应保持在500帕左右，若电极头打火，应向系统内用放气阀放少许气体；若灯管闪烁不定，应用微抽阀抽少许气体。直至灯管表面温度达到170度以上，电极头发红为止。在轰击过程中应保持电极和灯管温升的协调性，若电极头先红，应减低轰击档位或增加灯管内气压值；反之，若灯管温度过高，电极头不红，应提高轰击档位或减少灯管内气压值。

f) 打开扩散泵，高真空开关，抽高真空，此时电阻计应在0。5帕以内。一般首次启动扩散泵应在20分钟左右的预热时间。

g) 待灯管温度达到60-80度，先设订相应的充气值，按相应的氖气或氩气开关，充入工作气体。

h) 封离灯管，进行老练。

i) 停机：工作结束后，先关闭低高真空阀，扩散泵，真空泵1。待15分钟以后，关闭真空泵2，总电源和水。

Usage:

a) Put through the water source.

b) Insert the vacuum rubber pipe or weld pipe on the corresponding glass pipe, open the corresponding location valve.

c) Revolve the switch in the open position, and open the power supply of the electric resistance gage and thermometer respectively.

d) Open the vacuum pump, coarse vacuum switch, draw coarse vacuum, the electric resistance gage should be within 10Pa at this moment.

e) Make the high pressure export hold of the bombardment transformer meet on light pipe, nip on thermometer sensor, when the vacuum is at about 10Pa, turn off the coarse vacuum, open transformer switch, 7500V, 9000V, 12500V, 15000V in turn, and look the corresponding signal lamp. choose the correspond bombardment crosspiece seat according to the length and thickness of the light pipe. The length, thickness of the light pipe should be in direc proporation to the bombardment voltage. The air pressure should be kept at about 500Pa in the light pipe, if electrode head fires, you should use air escape valve to set free little gases in system; if the light tube flashes indefinitely, you should use slight draw valve to draw little gases up to the surface temperature of the light pipe reaches above 170 and the electrode head becomes red. At the process of bombardment, you should keep the coordination of the raise of electrode and light pipe, if electrode head becomes red first, you should reduce bombardment crosspiece or increase air pressure worth in light pipe; contrarily, if the temperature of the light pipe is over high and the electrode head doesn't red, you should enhance bombardment crosspiece or decrease air pressure worth in light pipe.

f) Open diffusion pump, fine vacuum switch, draw fine vacuum, The electric resistance gage should be within 0.5Pa. Ordinarily, the first heating time to start up diffusion pump should be at about 20 minutes.

g) When the temperature of the light pipe reaches 60-80℃, set up the corresponding charge value first, press the corresponding neon gas or argon gas switch, To fill in the working gas.

h) Envelop the light pipe and do tact.

i) Turning off the machine: close low high vacuum valve, diffusion pump, vacuum air pump first after finishing working. 15 minutes later, close vacuum pump, general power and water.

六． 注意事项：

a) 本机在货款付清条件下，自购之日起免费保修一年，终身维护。若有下列情况不予保修：A.款项未付清，未尽义务的；

B.未按本说明书逐步进行，自行更改操作程序和内容的；

C.未经厂家同意，私自乱拆乱修的；

D.应搬运等原因导致的外伤性系列问题；

E.因违反安全操作规程，断水干烧等原因导致系列性问题；

F.因病因无法断定的，如真空泵电机，扩散泵电炉，仪表变压器等；

G.不在维修范围之内的。

2．此机一定要安全接地。操作者尤其要牢记轰击电压的危险性，此电压为15000伏，电流为500-1500毫安，足够将人致于死亡。所以在操作时应在人体下面铺一层10-20毫米的绝缘胶垫，在轰击时身体的任何部位不要接触设备和工作台的导电部位，由此引起一切事故，概不负责。

3一旦打开扩散泵开关，应首先通水进行冷却，切记停水干烧，且出水温度不能超过45度。

4．在扩散泵打开时，即在打开高真空阀状态下，禁止向系统内放入大气，以免造成扩散泵油的氧化。

Points for attention:

A) Under the condition of paying up the money, the machine can receive the warranty of repairing for free for one year from the day you buy it. And maintain it for the whole life . The following conditions are the exceptions: A) money does not pay out and does not do his duty. B) Not follow the specification to operate gradually, change the operating procedure and content by him. C) Without the agreement of the manufacturer, open and repair it. D) outside- broken series of problems caused by the reasons as carriage. E) outside- broken series of problems caused by breaching safety operating rules, and drying without water. F) can't conclude as he illness. Such as: vacuum pump, electric engine, diffusion pump, electric stove and the instrument transformer, ect. G) Outside the range of maintaining.

2. the machine should be earth conductive safely. The operator should remember the risk of the bombardment voltage firmly. The voltage is 15000V, the electric current is from 500 to 1500milliampere, it can result in the death of people easily. Therefore, 10-20mm insulating rubber cushion should be under the body of people at the time of operation. Any parts of people's body should not touch the equipments and conducting electricity parts at the time of bombardment. All the accidents caused by this, we will have no responsibility.

3. Once open the diffusion pump, first of all, put through water to do cooling. Be sure to stop watr supply and do dry burn. The out water temperature can't exceed 45℃.

4. when the diffusion pump is open, that is the condition of the high vacuum valve, forbid to set in the air to the system in order to avoid the oxidation of the diffusion pump oil.

七．维修维护

1．电阻计漂移：即指针不在零点和大气，应在系统放入空气状态下，仪表指针应在100000帕，若不在，可调节大气旋钮。

3．低真空抽不上去：即真空度抽不到10帕以内，可能真空泵1的电机与泵脱落，真空泵油少或脏，灯管，工位阀，电磁阀或管道漏气。应采取缩小范围，逐步排除的方案进行解决。换油可用GS-3号高速直联真空泵油。

4．高真空抽不上去：即高真空度无反映，首先确定高真空管路的低真空是否可以，若不行，参考3项进行解决。若基础真空可以，可查是否有循环水或水温是否过高，是否有扩散泵加热电流。无电流，可查扩散泵下的电炉丝，更换可用650瓦电炉丝。若越加热真空度越下降，那需要更换扩散泵油，先用洗涤灵将扩散泵内部清洗干净，

用酒精脱水，吹风机吹干，换上120毫升的扩散泵油或275号硅油，重新装上扩散泵即可。注意：上螺钉时密封面一定要保持真空卫生，对角均匀上紧即可。

5．充气系统漏气：即气瓶压力保持不住。应用肥皂水涂连接处和焊接处，看是否有气泡冒出，或充气部位全部拆下放入水中查看是否有气泡。

6．温度计指示出乱：更换传感器。禁止试灯时用。

Maintain

1electric resistance gage drift: That is: the finger is not at zero and air, under the condition of setting in air to system, the instrument finger should be at 100000Pa, if not, you can adjust the air knob.

3. Coarse vacuum can not be drew up: That is: vacuity can not be drew within 10Pa,, maybe the electric engine of the vacuum pump falls off with the pump, the oil in vacuum pump is little or dirty, light tube, location valve, electro magnetic valve or pipe leak. You should adopt the program to reduce range and exclude gradually to solve it . Changing oil can use GS-3 No. high-speed straight pair of vacuum pump oil.

4. Fine vacuum can not be drew up: That is: high vacuity doe not reflect, first, confirm whether the coarse vacuum of the fine vacuum pipeline is ok or not. If not, refer to the third proceed to settle. If the basic vacuum is well you can check whether having recycled water or the water is high or not. Whether have diffusion pump heating current or not. If does not have current, check the electric stove wind under the diffusion pump. 650 watts electric stove wind can be used to replace. If the vacurity descends more when heating more, then, the diffusion pump oil needs to be changed. Use abluent to clean the inside of the diffusion pump. use alcohol dehydration and blower to blow dry. Change the diffusion pump oil of 120milliliter or 275No silicon fluid, reset the diffusion pump, then it will be ok. Notice: the sealed cover must be kept in vacuum and the opposite angles are on average tight when doing bolt.

5. The leakage of the charge system: That is the pressure of the gas cylinder could not be kept. The soap water can be painted at the connect place and weld place, and see whether the air bubble comes out or not. Or knock down the whole charging part and put them into water and see whether comes air bubble or not.

6. Thermometer designs disorderly: Replacing sensor. Forbid using it at the time of trying lamp.

八．使用技巧：

 1．一快二慢三到位工艺法：一快，充气完要及时封离，越快越好；二慢，1慢，轰击过程要慢，保证灯管和电极温升的协调性，2慢，充气前抽真空时间要长一些，保证灯管内的真空度；三到位，1到位，真空度到位，2到位，灯管和电极除气到位，3到位，充气量到位。一般氖气为12-15毫米汞柱，氩气

为8-12毫米汞柱。

2．四点应急措施：

a.若温度计坏，可用草纸代替。

 b.若真空仪表有问题，可用水银表代替。

 c.若工位阀有问题，可直接去掉。

 d.若扩散泵有问题，可直接用低真空。

3．排气管放电三点解决方案：

a.真空抽得高一些，应在5帕以内。

 b.两根一起排，高压线夹在远离排气的那一端。

c.加上玻璃阀门，割断气源。

Usage skill:

 1. A fast two slowness three arrives craft method: A fast, seal timely after finishing charging, the faster the better; two slowness, first slowness, bombardment process should be slow to ensure the coordination of the temperature of the raise of the light pipe and electrode. 2nd slowness, the time of drawing vacuum should be much longer before charging to ensure the vacuity in the light pipe; three arrives, first arrives, vacuity arrive, 2 arrives, the out gassing arrive of the light pipe and electrode, 3 arrives, charge quantity arrive. Ordinarily, the neon gas is 12-15 millimeter column of mercury; argon gas is 8-12 millimeters column of mercury.

2. Four point of emergency measure:

a. If thermometer is bad, toilet paper can be used.

 b. If vacuum instrument has problems, mercury watch can be used.

 c. If location valve has problems, can be taken away directly.

 d. If diffusion pump has problems, coarse vacuum can be used directly.

3 three point of settling scheme of the discharge of the exhaust pipe:

a. draw vacuum much higher, it should be within 5Pa..

 b. Two arrange together, high tension line nips at the end away from the exhaust end.

c. Add glass valve, cut off gas source.

九. 验收报告

1.气瓶纯度为99.999%,压力为10Mpa,压力表指示正常,合格.

2.低阀,高阀,针阀,防汞阀上的开关密封性好,松紧合适,合格.

3.主管道及附件上玻璃机械强度高,密封性强,合格.

4.真空表头指示正常,合格.

5.密封件完好,合格.

6.整个金属箱体完好,合格.

7. 真空仪表指示正常,合格.

8.扩散泵运转正常,合格.

9.真空泵运转正常,合格.

10.各面板上字样印刷清楚,合格.

11.温度计指示正常，合格。

12。整机运转正常，合格。

The receiving report

1. The purity of the gas cylinder is 99.999%, pressure is10Mpa, manometer designs normally, eligibility.

2. The leak-tightness of the switch of Low valve, high valve, reed valve, prevent switch, and mercury valve is good, eligibility.

3.The strength of the direct and glass machine is robust, and the leak-tightness is strong, eligibility.

4. Vacuum header designs normally, eligibility.

5. The sealed sets are intact, eligibility.

6. The whole metal case is intact, eligibility.

7. The vacuum instrument designs normally, eligibility.

8. Diffusion pump runs normally, eligibility.

9. Vacuum pump runs normally, eligibility.

10. Sample print on each faceplate is clean, eligibility.

11. Thermometer designs normally, eligibility.

12.The whole machine runs normally, eligibility.