

# 承 认 书

## SPECIFICATION FOR APPROVAL

客户名称(customer): \_\_\_\_\_

产品名称(article name): 金卤灯电子镇流器 electronic ballast for halide lamp

产品型号(model NO): HD-E20/W/O

送样人(delivered by): \_\_\_\_\_

日期(date): \_\_\_\_\_

客户确认/APPROVAL			
部门 Department			
签章(字) Signature			
日期 Date			

## 1、概述:

CPU 数字控制、监控并优化运行参数 Controlled, monitored and optimized by CPU

无频闪 No blink

低频方波输出、无音频共振 Low frequency output, no sonic resonance

快速盲区响应、高可靠性 Hi speed blind zone response, hi reliability

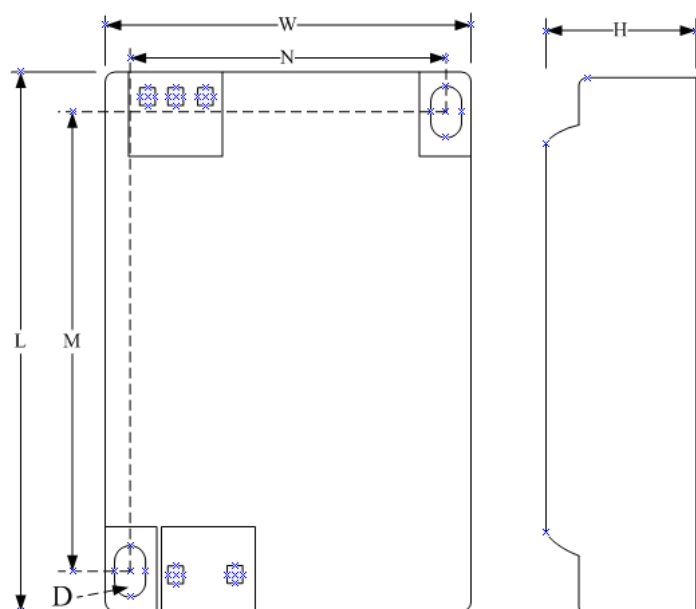
多重保护响应 Multiple protection

适应不同环境与无环境污染 Fit for different using condition and pollution free

非连续高压脉充点火 None-continuous hi voltage pulse ignition

恒定并可设定功率输出, 优化光源色温一致性 Constant and adjustable power out, consistence of light color

## 2、外形及结构尺寸 (out structure , dimensions):



L=114mm W=78mm H=32mm

M=101mm N=63mm D=2.0mm

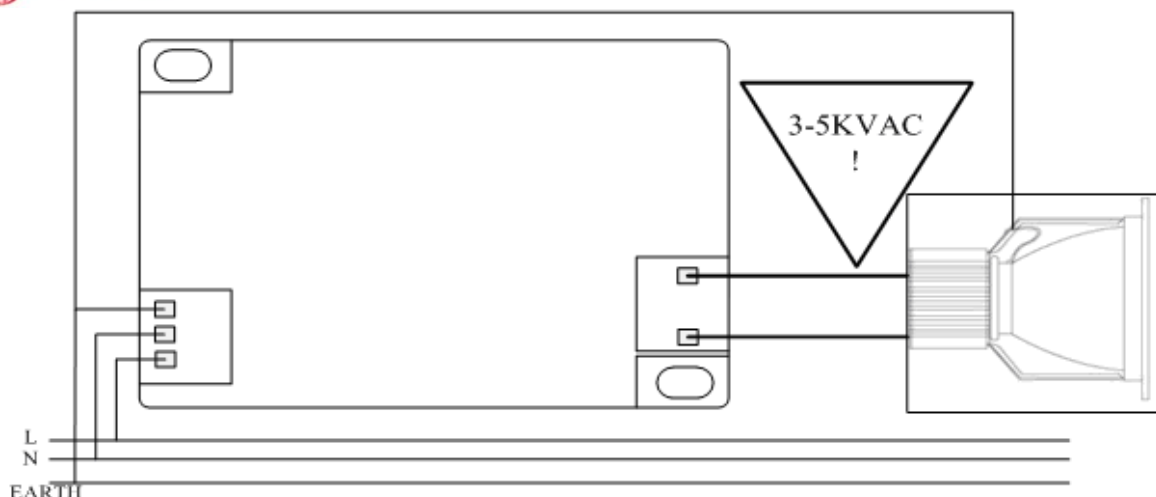
端子: 输入端: 按压式

输出端: 按压式

尺寸公差(dimension tolerance):  $\pm 1\text{mm}$

材质(material): 铝底壳(aluminum bottom case), PVC 覆盖(PVC cover)

## 3、连线图 (wiring diagram) :



#### 4、产品规格(specifications):

参数 parameters	设定条件 test condition	最低 min	标准 normal	最高 max	单位 unit
额定输入电压 voltage input	25°C	187	220	253	伏特 V
输入电压安全范围 Safe voltage input range	25°C	176	-	265	伏特 V
输入频率 frequency input	25°C	0	50-60	-	赫兹 HZ
输入功率 power input	25°C, 220VAC	22	25	26	瓦特 W
灯管功率 power output	25°C, 220VAC	-	20	-	瓦特 W
输入电流 current input	25°C, 标准输入电压(standard voltage)220VAC	-	0.10	-	安培 A
功率因数 power factor	25°C, 标准输入电压(standard voltage)220VAC	0.91	0.92	0.95	-
输出频率 (50%方波) Freguency output(50% square wave)	25°C, 标准输入电压(standard voltage)220VAC	38	120	-	赫兹 HZ
启动电压 Ignition voltage	25°C, 标准输入电压(standard voltage)220VAC	-	3.00	5.00	千伏 KV
耐压绝缘 isolation voltage	1500V; 1分钟(minute)	-	5	-	毫安 mA
浪涌承受 surge capacity	1KV/1ms-1s/1min	-	通过 OK	-	-
使用环境温度 working environment temp.	标准输入电压(standard voltage)220VAC	-15	-	+50	摄氏度°C
外壳最大容许温度 Sheel sufferance Max temp	标准输入电压; 正常环境 (standard voltage,normal enviroment)	-	-	+75	摄氏度°C

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平均产品寿命 life Average working life	于 40℃ 壳温下(in 40℃ environment)	50000	-	-	小时 HS
故障率(工作 1000 小时) Default rate (working in 100 HS)	于 40℃ 壳温下(in 40℃ environment)	-	-	0.20%	-
输出短路保护 Output short current protection	-	-	有 OK	-	-
灯管寿终开路保护 Dying bulb open current protection	-	-	有 OK	-	-
输入输出误反接保护 Wrong input wiring protection	-	-	有 OK	-	-
灯管寿终极化保护 Polarization of dead bulb protection	-	-	有 OK	-	-
意外断电自启动 Ignition after accident power off and on	-15---+50℃	-	有 OK	-	-

## 5、使用说明(operation instruction):

5.1 使用本镇流器应该按照其应用条件使用。

Using under the instructed conditions

5.2 特别不能使用于不同额定电网。安装、拆卸本镇流器需要国家标准认定的合格专业技术人员操作。安装过程中不可带电操作。

Never using in an incorrect voltage power net. It shall be installed and uninstal by authorized personnel only, never operating electrified.

5.3 应保证接地引线及输入输出引线及端子之间接触良好，镇流器保护地线必须接大地。

Insure to be good connected between the wire and the terminals, insure to be good earthed.

5.4 电子镇流器在使用中不能有异物覆盖，避免引发火灾。

Never cover any articles over the ballast to avoid fire.

5.5 电子镇流器内部不允许拆卸和改动。

Never disassemble or modify

5.6 不可以将电子镇流器与电感镇流器装在同一个电源回路。

Never use the electronic ballasts and inductor ballasts in a same power loop.

5.7 在进行高压测试之前，电子镇流器的输入接线必须短路在一起（不包括保护接地）。

To short cut the input terminals (exclude earth terminal) before high voltage test.

5.8 灯泡接线必须使用高压线（至少 5KV）。

灯座需为高压灯座（需可承受至少 5KV 的启动电压）。

The wire from the ballast to the bulb shall be high voltage isolation (5KV for min)

The bulb holder shall be high voltage isolation (5KV for min)

5.9 电子镇流器与灯泡之间所允许的接线长度视线材与接线方式而有不同的要求，但不论使用何种线

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材, 最重要的要求就是电子镇流器与灯泡之间所允许的接线总电容量不可超过 150PF (换算成一般的高压线长度大约 2m, 以上数据仅供参考, 实际的接线长度必须依照接线总电容量的限制)。(the permitted length of the wires from the ballast to the lamp may be changed by different wiring method, anyway, the permitted capacitor generated by the wire shall be less than 150PF(or 2 meters long of the wire, for reference only, the actual length of the wire shall follow the limit of the capacitor generated by the wire)

5.10 输入输出线不可对外壳短路。Never short cut the input and output wire to the case of the ballast.

## 6、安全特性及测试方法(safety characters and test method):

6.1 绝缘强度 1.5KV/60s/5mA (高压测试机设定电压交流 1.5KV, 漏电流 5mA, 时长 60s)

Isolation capacity 1.5KV/60s/5mA (high voltage tester is set to AC1.5KV,5mA leakage current,60s)

6.1.1 输入端绝缘 Input terminal isolation

短接镇流器输入端 L 和 N, 将高压测试机地线接镇流器外壳, 高压输出端接镇流器输入端 L 和 N, 打开高压输出漏电流不超过设定;

To short cut the terminals of L and N, connect the case to the earth terminal of the tester, input the high voltage to L and N, the test voltage shall be not exceed the specified value.

6.1.2 输出端绝缘 Output terminal isolation

短接镇流器输出端两端口, 将高压测试机地线接镇流器外壳, 高压输出端接镇流器输出端两端口, 打开高压输出漏电流不超过设定;

To short cut the terminals of output, connect the case to the earth terminal of the tester, input the high voltage to L and N, the test voltage shall be not exceed the specified value.

6.2 浪涌吸收 1KV/1ms-1s/1min

Surge capacity 1KV/1ms-1s/1min

6.3 反接 opposite wiring

将经过电气隔离的 220V/50Hz 交流电源接入镇流器输出端口, 光源接入镇流器输入端口 L 及 N, 打开电源 10s, 关电源。退出测试 1 分钟后, 镇流器无损坏。

To connect the power wire of 220V/50HZ to the output terminals of the ballast, turn on the power in 10s, turn off the power. wait for 1 min, the ballast should work properly again.

6.4 输出短路 Output short cut

6.4.1 安装短路 Output short cut

将镇流器输入端接入 220V/50Hz 交流电源, 输出短口短接, 打开电源 1 分钟, 退出测试 1 分钟后, 镇流器无损坏;

Short cut the output terminals, connect the input terminals to the power of AC220V/50HZ, turn on the power in 1 min, wait for 1 min, the ballast should work properly again.

6.4.2 灯具意外短路 Accident short cut of the lamp

将镇流器输入端接入 220V/50Hz 交流电源, 输出短接入相应规格光源, 打开电源并待到灯光稳定 (光源管压降大于 60V), 短接输出端口, 镇流器应停止工作, 退出测试 1 分钟后, 镇流器无损坏;

Connect the ballast to the power of AC220V/50HZ and proper light bulb, turn on the power till the bulb to get the stable light(the voltage of the bulb reaches more than

60V), short cut the output of the ballast, the ballast shall stop working, wait for 1 min, the ballast should work properly again.

## 6.5 光源失效 Default of light bulb

### 6.5.1 光源开路失效 Open circuit of light bulb

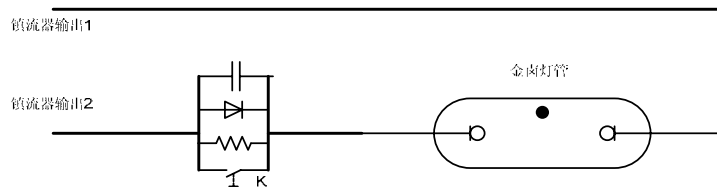
将镇流器输入端接入 220V/50Hz 交流电源, 输出端口悬空, 打开电源并计时, 镇流器工作于热太点火模式, 15 分钟后应自动停止工作, 退出测试 1 分钟后, 镇流器无损坏;

connect the ballast to the power of AC220V/50HZ and keep the output terminals free, turn on the power and count in the mean time, the ballast stops igniting. Wait for 1 min, the ballast should work properly again.

### 6.5.2 光源极化失效 (模拟测试) Polarization of bulb default (simulated test)

将镇流器输入端接入 220V/50Hz 交流电源, 输出端与光源串联如下电路, K 置闭合, 打开电源, 镇流器工作, 待光源压降升到 60V 以上, 置 K 断开, 镇流器应自行关闭, 退出测试 1 分钟后, 镇流器无损坏;

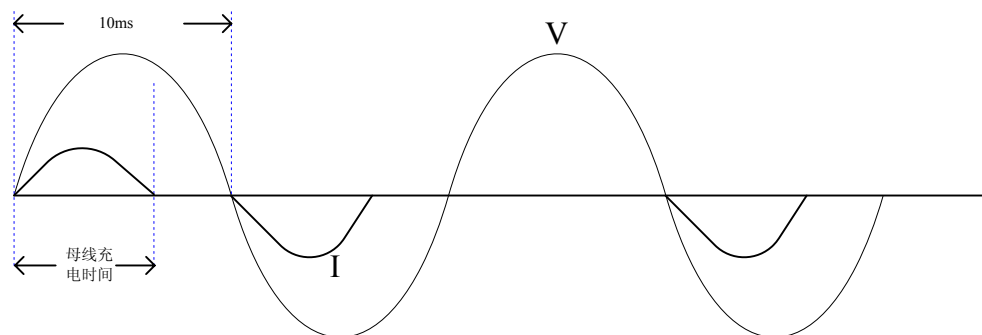
Connect the ballast to the power of AC220V/50HZ, the output terminals shall be wired as the diagram instructed below. To switch on K, turn on the power, wait till the voltage of the bulb reaches more than 60V, switch off K, the ballast shall stop working, wait for 1 min, the ballast should work properly again.



## 7、输入特性 output characters:

### 7.1 系统建立区间 System set up interval

输入电流电压时态



如上图: 由于系统建立初期, 后级需要初始化, 负载未启动, 输入电容和母线电容的综合作用, 电流与电压相位不同步, 并且 PWM 关闭时间较长, 故谐波增大。

As the diagram shows above, the initial stage of the system set up, the backward stage needs initialization, the load has not been started, the comprehensive action of input capacity and mother line capacitor, the asynchronous of the phase of current and voltage, furthermore, the period of PWM shutting is longer, so, harmonic waves increase.

综合指标: comprehensive index

(输入电压范围 210-230V 频率 50-60Hz) (input power of AC220V/50HZ)

电流总谐波 THD ≤ 39%

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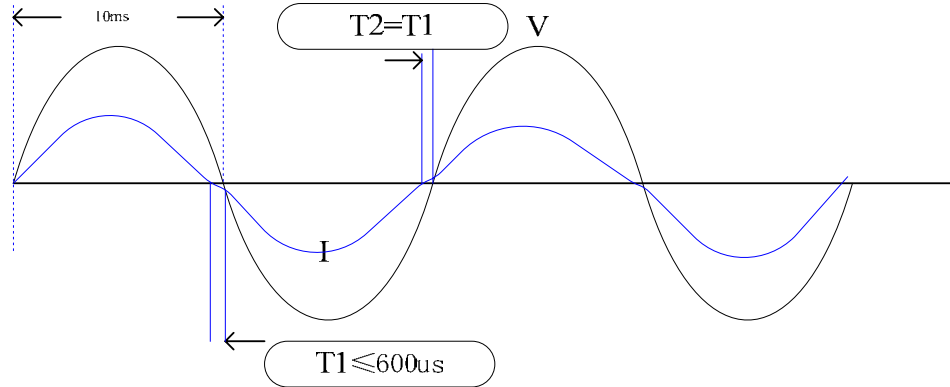
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功率因素不作计量 power factor is not included to calculated  
 系统建立时间 time of system set up ≤ 3s  
 整机功耗 total ballast power Consumption ≤ 0.5W

7.2 系统稳定和恒功率区间 System stability and fixed power interval

输入电流电压时态



如上图：由于 APFC 乘法器过零死角和输入滤波电容的综合作用，造成交流电压过零时候的回流和 PWM 占率不完全吻合电压相位角，形成电流与电压相位存在微量偏移。导致高次谐波增加。  
 As the diagram shows above, caused by the comprehensive action of dead-angle near line voltage zero-crossings and the APFC multiplier and filtering capacitor, induce reflucence near line voltage zero-crossings and PWM occupy rate is not inosculate the voltage phasic, thus causes micro-offset of the phase of the current and the voltage, higher harmonics increase.

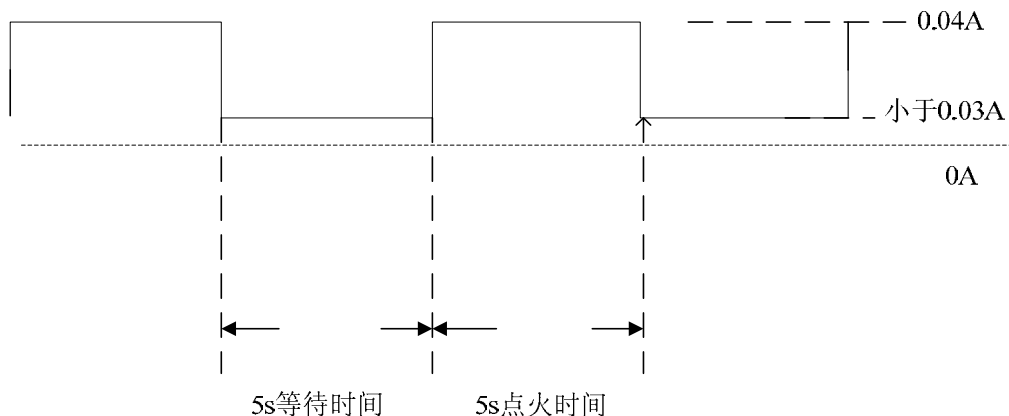
综合指标：（输入电压范围 210-230V 频率 50-60Hz）  
 comprehensive index (input power of AC220V/50HZ)

电流总谐波 THD ≤ 15%  
 功率因素 power factor ≥ 0.91  
 整机功耗 total ballast power Consumption ≤ 5W

7.3 系统工作于热态点火模式 System working in hot ignition mode

由于输出时序的影响，输入电流发生周期变化，最长维持 15 分钟自行关闭。

The output 时序 causes the change of input cycle, it will stop working in max 15 min.



等待时间整机功耗小于 0.5W, 点火时间整机功耗小于 8W, 此时间段允许系统闪闭和重新建立, 中断时间小于 0.5s。在输入电压范围 210-230V 频率 50-60Hz 电源下, 电流总谐波 THD ≤ 39%。

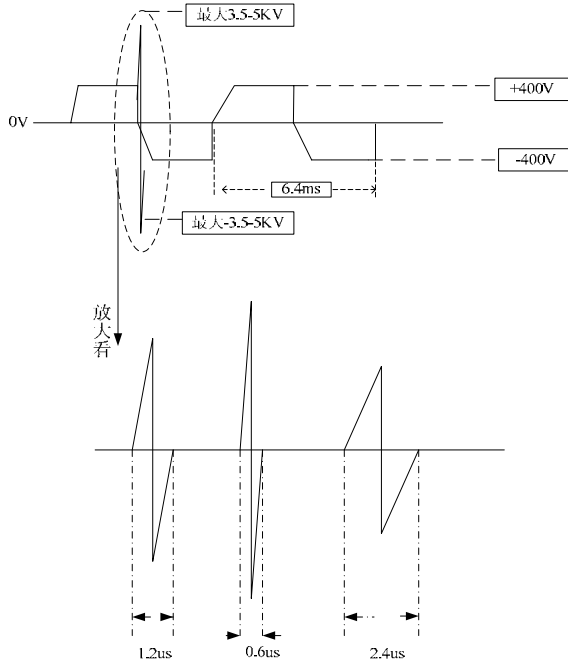
total ballast stand by power Consumption is less than 0.5W, total ballast ignition power consumption is less than 8W, the system flash shut down and re-set-up is allowed during this period, the break off

time is less than 0.5s, in the condition of input power of AC220V/50HZ, THD  $\leq$  39%.

## 8 输出特性 output characters:

### 8.1 启动区间 starting interval

#### 8.1.1 点火高压及初始电源输出 ignition high voltage and initial power output

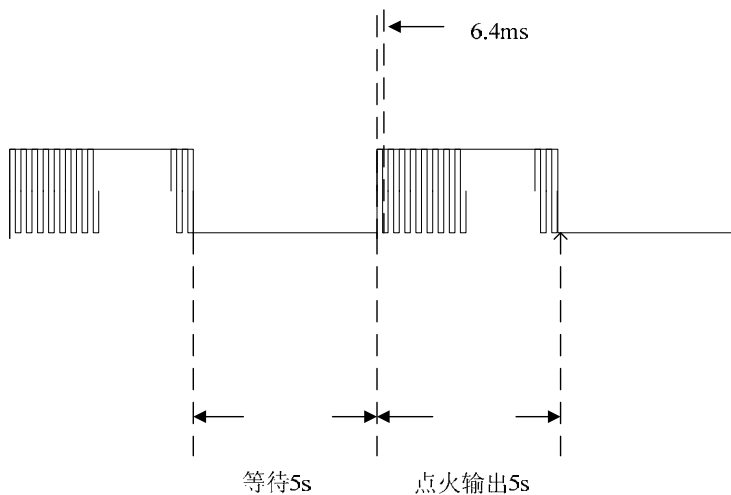


如上图：上升沿与下降沿相同，点火高压最大值为 3.5-5KV，一个输出交流周期两次。

As the diagram above shows, the increasing brim and decreasing brim are the same, max ignition voltage is 3.5-5KV, twice in an alternative phase.

#### 8.1.2 光源热态点火时序

Time sequence of ignition in hot bulb mode



热态点火模式自上电计时，维持 15 分钟，期间点着则进入维持模式，如仍未点着则自行关闭。此区间允许光源发生辉光放电，允许点火不成功时重新建立系统，重新进入点火程序。

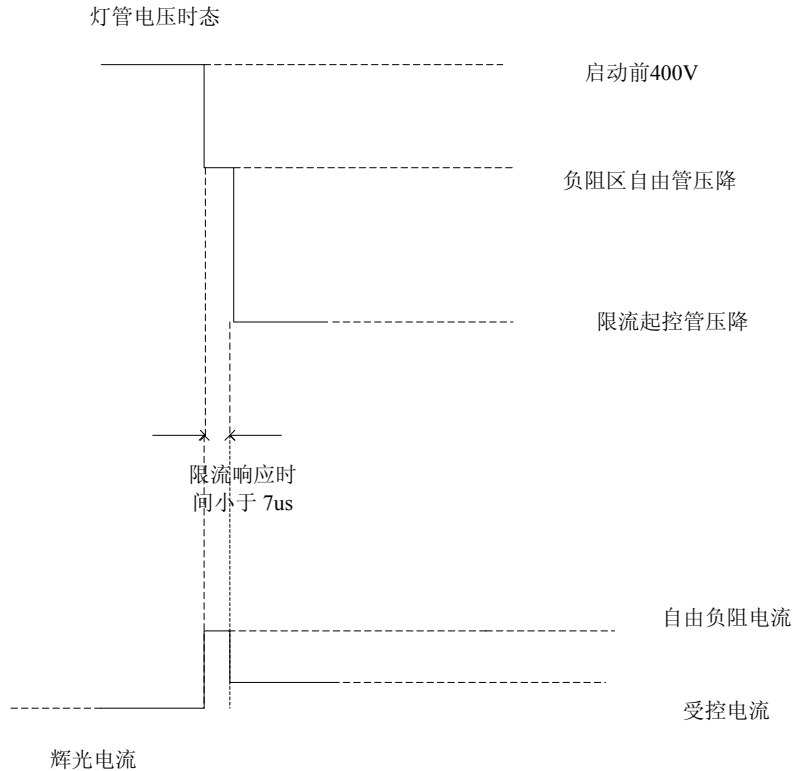
The ignition in hot bulb mode will maintain 15 min since the power turned on, if the bulb be ignited properly, the ballast will enter the period of maintain mode, if not, it will stop. During this period, glow



discharge is allowed to appear and if it false to ignite properly, the system is allowed to re-set-up, to enter the ignition form again.

## 8.2 稳定区间 (管电压小于 50V 之前) stable interval (before the voltage of bulb less than 50V)

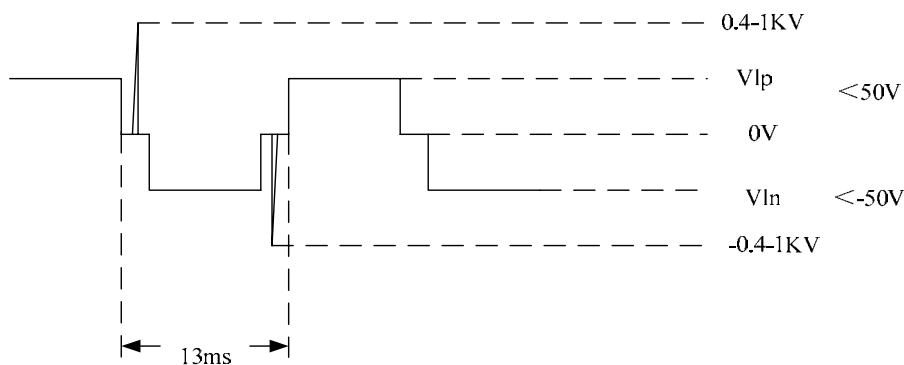
### 8.1.1 限流响应 current limit response



如上图,光源发生弧光放电后电流立即受控其响应时间不大于 7us。

As the diagram shows above, after the glow discharge happened, the time response of the current being instantly controlled is less than 7us

### 8.1.2 防熄灭反冲 recoil of extinction



### 8.1.3 限流电流 limited current

限流电流 limited current 0.7 ---0.9A

### 8.1.4 保护响应 protect response

短路保护 short response < 5ms

开路保护 open response < 5ms

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## 8.2 恒定功率区间 fixed power interval

### 8.2.1 恒定功率 fixed power

可调 adjustable(最大 max 18-30W)

一般设置在 normal set in 19—20W

### 8.2.2 恒功率管压范围 fixed power transistor range: 50-150V

### 8.2.3 保护响应 protect response

短路保护 short response <5ms

开路保护 open response <5ms

### 8.2.4 镇流器自耗电 ballast self loss

于恒功率状态，镇流器最大自功耗小于 7W（输入电压 215-230V 频率 50Hz）

In the mode of fixed power, the self loss of the ballast is less than 7W (power of AC220V/50HZ)

### 8.2.5 综合指标 comprehensive index

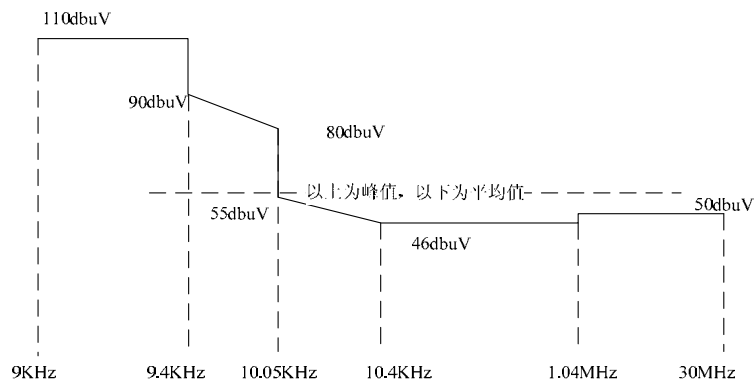
电压波峰比 voltage CFI <1.5,

电流波峰比 current CFI<1.7

频率 frequency 120Hz（50%方波 square wave）

噪音 noise <35db（密闭空间距离镇流器 1 米 in a closed space and 1 meter from the ballast）

## 8.3 EMI（恒定功率区间）指标 EMI(fixed power interval) index

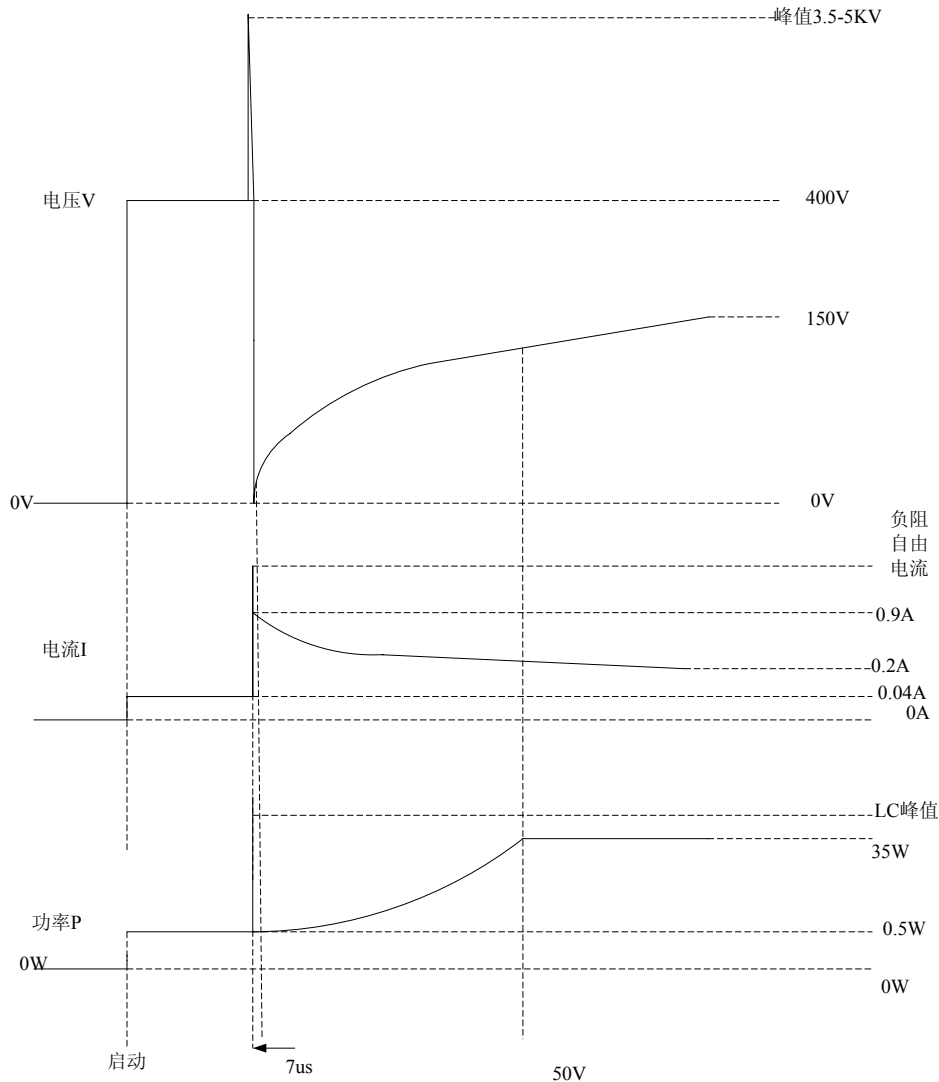


按照 GB17743-1999 标准和测试方法，谐波辐射不超过图示指标。

According to GB GB17743-1999 standard and test method, harmonics radiation is not exceed the diagram shows above.

## 8.4 标准全程电流电压功率曲线 standard all process current, voltage and power curve

电压电流均为交流绝对值



## 8 其他特性 other characters

8.1 寿命 50000 小时（工作于 25-40℃ 开放环境） 容许温度范围：-20-95℃

但是产品寿命随温度升高每 10℃ 下降 50%

Life 50000 hs (in the condition of 40℃ open environments), permitted temperature range: -20-95℃

And the life will decrease 50% in every 10℃.

8.2 自温升 self temperature rise

产品于 20—30℃ 开放环境下，电源 50Hz 电压 220-230V，点着光源开机两小时，外壳最高温度上升小于 20℃，此项仅供参考，不需量化计量。

In the open environment of 20-30℃, power AC220-230V, 50HZ, after the ballast work 2 hours properly, the max temperature rise of the case shall be less than 25℃, this is for reference only, not quantitatively calculated.

备注：测试条件是大气压力为常压；空气相对湿度小于 75%；镇流器按顶标接线图连接并必须良好连接地线；使用同等标准规格金卤灯光源。

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特别提示: 1、本品有高压输出, 产品通电时和通电后严格避免人体与产品及附属零件等接触;  
2、金卤灯发光亮度较强, 测试时应做好眼睛防护, 避免伤害。

Remark: test in normal pressure ,relative humidity is less than 75%,the ballast is properly wired as instructions and well earthed, using standard halide bulb.

Special notice: 1, be aware of high voltage risk, never touch the ballast and its attachment while power turned on.  
2,halide bulb will release strong rays, please wear proper glasses to avoid the risk of light.