

**电涌保护器 Surge Protective Devices****目錄**

1 适用范围 Scope .....	2
2 术语 Glossary.....	2
3 型号说明 Part Number System .....	2
4 结构尺寸 Structure and Dimension.....	3
4.1 尺寸 Dimensions (mm).....	3
4.2 应用示意图 Application Schematic .....	4
5 安规认证 Agency Approvals.....	4
6 技术参数 Specifications.....	5
7 检验 Inspection.....	6
7.1 大气条件 Atmospheric Conditions .....	6
7.2 常规检验项目 Routine Inspection Items.....	6
7.3 机械特性 Mechanical Performances.....	7
7.4 动作负载试验 Operating Duty Test.....	8
7.5 电压保护水平测试 Voltage Protection Level Test .....	9
7.6 异常过电压限制电流测试 Limited Current Abnormal Overvoltage Test.....	10
8 安装使用及维护 Installation and maintenance .....	11
9 标示及包装 Marks and Package.....	12

## 电涌保护器 **Surge Protective Devices**

### 1 适用范围 Scope

EZ20D(G)277M(S)-L (G)适用于 90V~305V 交流电系统或者一般的电压驱动器和整流器。

电涌保护等级：标称放电电流  $I_n$ ：5kA/最大放电电流  $I_{max}$ ：10kA (8/20 $\mu$ s)；

复合冲击波  $U_{oc}$ ：12kV (1.2/50  $\mu$ s)

使用耐高温防火外壳；IP67。

EZ20D(G)277M(S)-L (G) is applicable for 90V~305VAC system or general voltage driver and rectifier,

Surge protection level：  $I_n$  5kA /  $I_{max}$ ：10kA (8/20 $\mu$ s) ；

Combination Impulse Wave  $U_{oc}$ ：12kV (1.2/50  $\mu$ s)

Using the high temperature resistant and flameproof enclosure, IP 67.

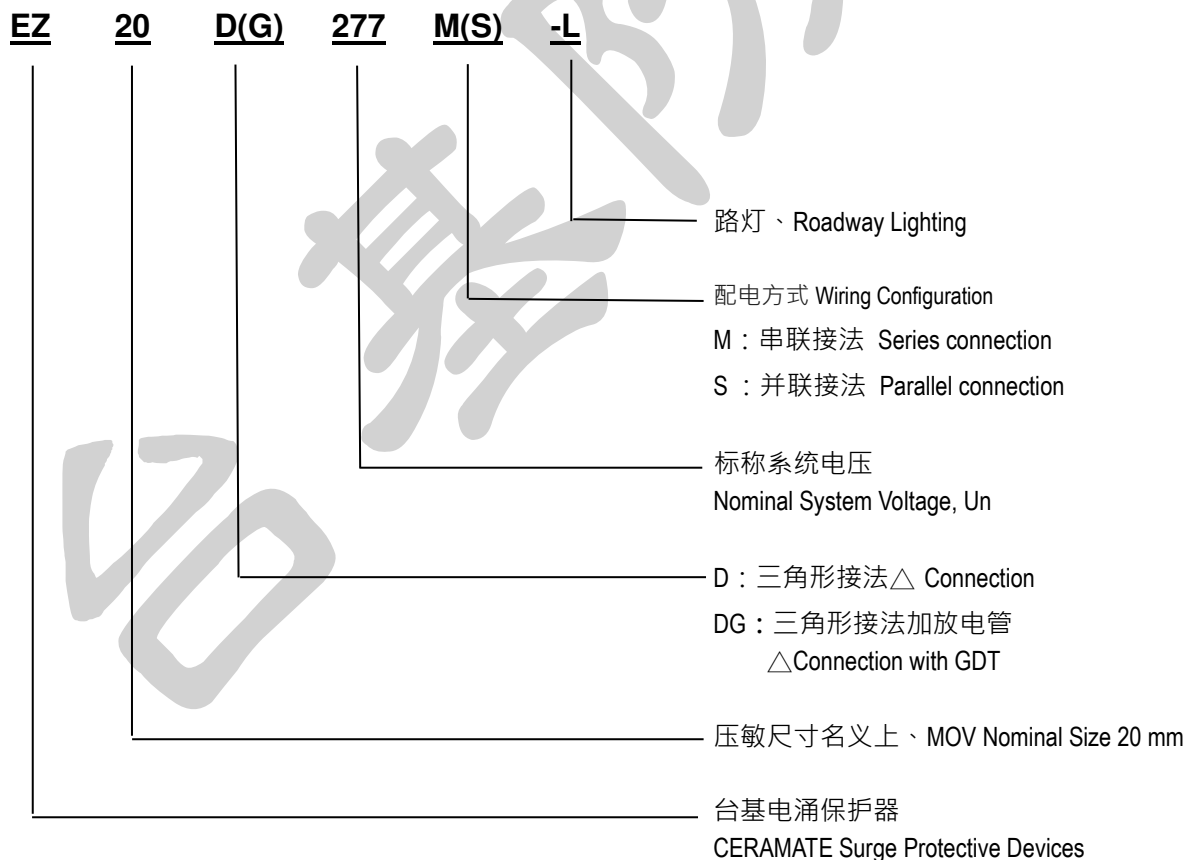
### 2 术语 Glossary

参考标准 Reference Standards

UL1449 第四版 2014, IEC 61643-11：2011, IEC61643-1：2005, EN61643-11：2012

GB/T 18802.1-2011

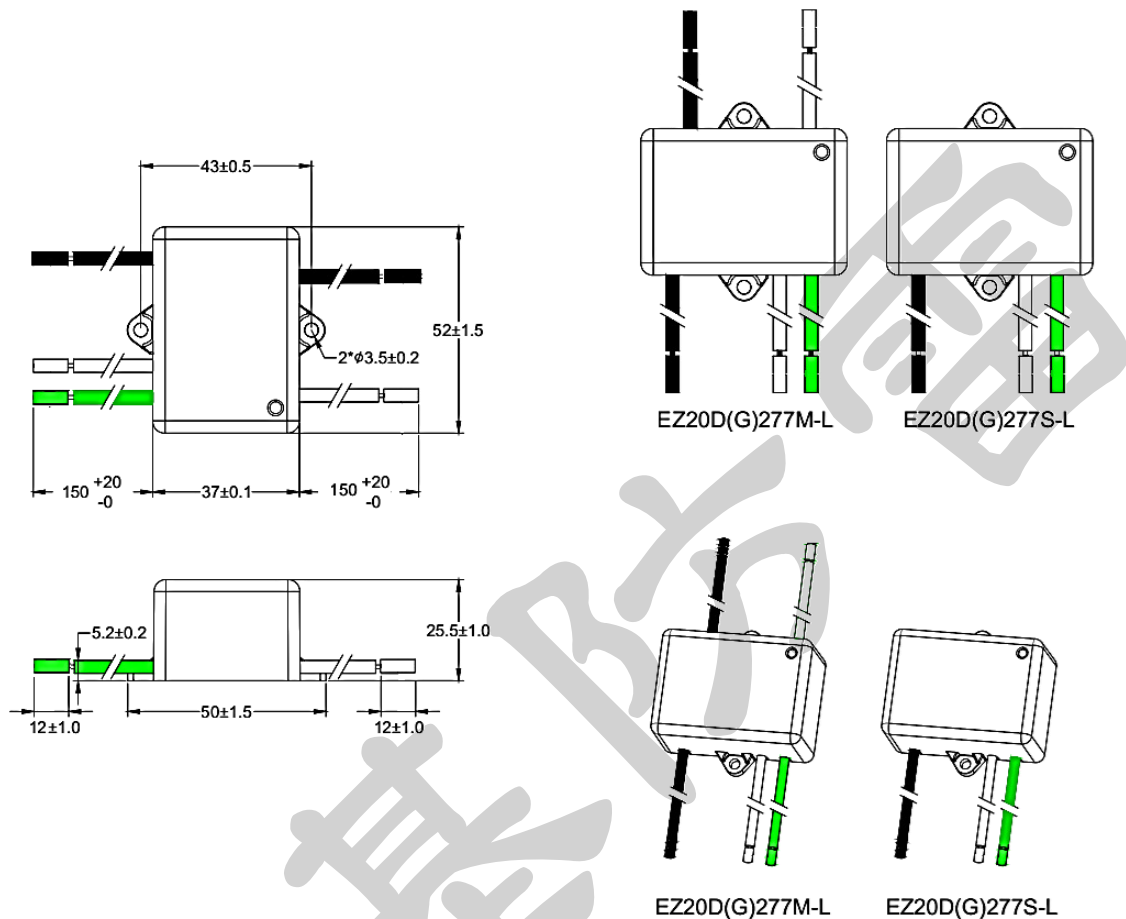
### 3 型号说明 Part Number System



# 电涌保护器 Surge Protective Devices

## 4 结构尺寸 Structure and Dimension

### 4.1 尺寸 Dimensions (mm)



**注意:**

线规：AWG14 号线；输入线长度  $150^{+20}_0$  mm, 输出线长度  $150^{+20}_0$  mm · 导线尾端  $12 \pm 1.0$  mm 割开不去皮。

电线颜色：输入：火线：黑色，零线：白色，地线：绿色，

输出：火线：黑色，零线：白色。

**Notes:**

Wire Gauge : AWG14 wire ;

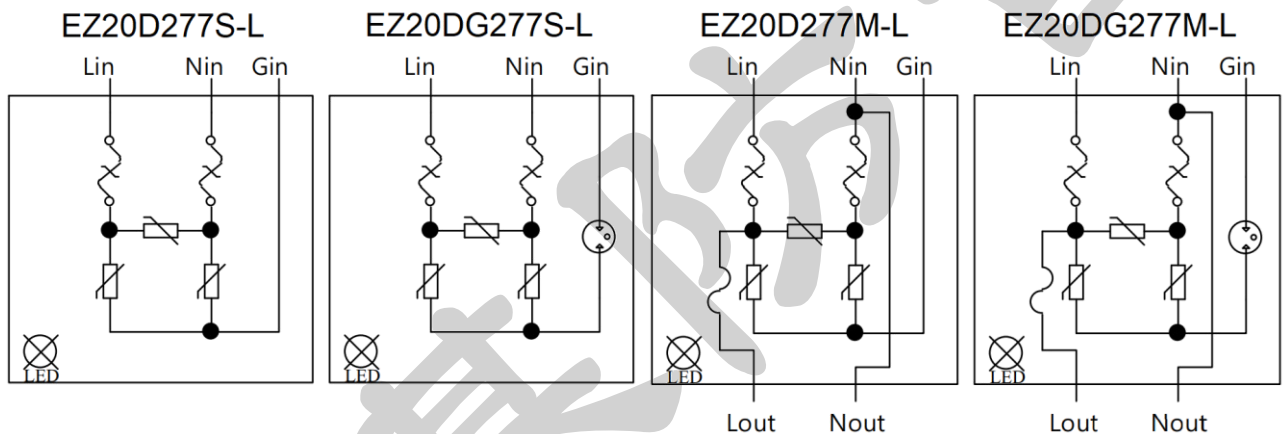
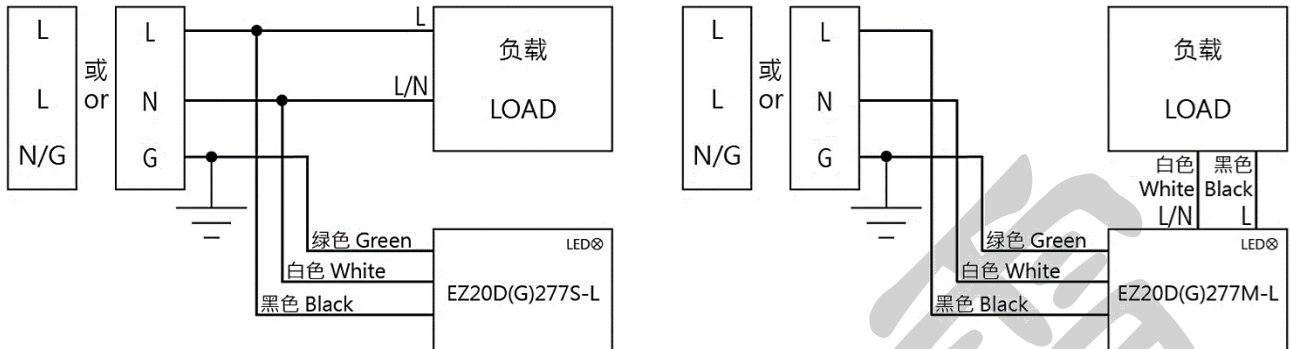
Wire Length : 150mm or customized, cutting lead wires on  $12 \pm 1.0$  mm from tail terminals but not stripping

Input : Black: Line , White: Neutral, Green: Ground . Line length:  $150^{+20}_0$  mm.

Output : Black: Line , Blue: Neutral , Line length:  $150^{+20}_0$  mm






## 电涌保护器 Surge Protective Devices

### 4.2 应用示意图 Application Schematic



备注: 1. LED 常态有保护时亮。  
 Note: 1. Under protected LED normally on.

### 5 安规认证 Agency Approvals

认证机构 Agency	标准 Standards	认证号 File NO.	类别 Category
 UL	UL 1449 4 <sup>th</sup>	E315429	VZCA2 4CA 类 Type 4CA
 UL	CSA C22.2 No.269.5-17	E315429	VZCA8 4CA 类 Type 4CA
 CE	IEC 61643-11	E483592	VZCC II 类 Class II III 类 Class III
 UL (Demko)	EN 61643-11	DK-71934-M1-UL	II 类 Class II III 类 Class III
 CQC	GB18802.1-2011	CQC19123227711	II 类 Class II

## 电涌保护器 Surge Protective Devices

### 6 技术参数 Specifications

产品型号 Product Model	单位 Unit	EZ20D277S-L	EZ20DG277S-L	EZ20D277M-L	EZ20DG277M-L	
温湿度范围 Temperature and Humidity Range		安规认证 温度：-40°C至 85°C 湿度：5%至 95%RH Agency approval Temperature : -40°C to 85°C/ Humidity : 5%-95% RH		安规认证 温度：-40°C至 70°C 湿度：5%至 95%RH Agency approval Temperature : -40°C to 70°C/ Humidity : 5%-95% RH		
		扩展技术参数 温度：-40°C至 105°C/ 湿度：5%至 95%RH Extended technical data Temperature : -40°C to 105°C / Humidity : 5%-95% RH				
标称系统电压 Nominal System Voltage, Un	Vac	90-305				
最大连续工作电压 Maximum Continuous Operating Voltage, Uc	Vac	320				
工作频率 Working Frequency	Hz	50/60				
标称放电电流 Nominal Discharge Current, In (8/20us)	kA	5				
复合冲击波 Combination Impulse Wave Uoc (1.2 / 50 us) *备注 2 *Note 2	kV	12				
最大放电电流 Maximum Discharge Current, Imax (8/20us)	kA	10				
测量限制电压 Measured Limiting Voltage, MLV UL 认证适用 Suitable for UL Approval	L-N	V	1250	1250	1310	1310
	L-G	V	1310	1780	1320	1750
	N-G	V	1220	1810	1170	1620
电压保护水平 Voltage protection level, Up CE, CB, T2 认证适用 Suitable for CE, CB, T2 Approval	L-N	V	1200	1200	1200	1200
	L-G	V		1800		1800
	N-G	V				
电压保护水平 Voltage protection level, Up CE, CB, T3 认证适用 Suitable for CE, CB, T3 Approval	L-N	V	1300	1300	1500	1500
	L-G	V		2900		2900
	N-G	V				
电压保护水平 Voltage protection level, Up CQC, T2 认证适用 Suitable for CQC, T2 Approval	L-N	V	1400	1300	1200	1200
	L-G	V		2000		2000
	N-G	V				
额定负载电流 Rated Load Current, IL	A	—		5		
防护等级 Ingress Protection Level		IP67				

备注 1：EZ20DG 型号在共模模式(L-G 与 N-G)有串联 GDT。

Note 1：EZ20DG model with GDT in series in common mode (L-G and N-G)

备注 2：电涌保护器安装于受试设备后，  
 依照 IEC 61643-11：2011, III类，  
 - 每个保护模式, 使用新的样品试验，  
 各模式：12kV/6kA, 2 ohm  
 或依照 IEC 61000-4-5：2014  
 - 测试波形：复合波；  
 - 同一只产品同时满足。  
 差模：L-N, 10kV/5kA, 2 ohm  
 共模：L-G / N-G, 10 kV / 833 A, 12 ohm  
 - 浪涌次数 (对各耦合路径)：应分别在 0°, 90°, 180°  
 与 270° 相角施加正、负极性各 5 次；  
 - 连续脉冲间的时间间隔：1 分钟或更短；  
 耦合阻抗：差模 18 μF · 共模 9 μF + 10 Ω。

Note 2：After installed SPD in EUT,  
 in according to IEC 61643-11：2011, class III,  
 - Using new samples each time to perform test on  
 each protection mode, each mode: 12kV/6kA, 2 ohm  
 or in according to IEC 61000-4-5：2014  
 - test waveform: combination wave;  
 - the same sample to be satisfied to.  
 Differential mode: L-N, 10kV/5kA, 2 ohm  
 Common mode: L-G / N-G, 10 kV / 833 A, 12 ohm  
 - number of impulses (for each coupling path): five  
 positive and five negative impulses each at 0°, 90°,  
 180° and at 270°;  
 - time between successive impulses: 1 min or less;  
 - coupling impedance: differential mode 18 μF,  
 common mode 9 μF + 10 Ω

# 电涌保护器 Surge Protective Devices

## 7 检验 Inspection

### 7.1 大气条件 Atmospheric Conditions

温度 Temperature : 15 °C - 35 °C

相对湿度 Relative Humidity : 45%-75%

大气压力 Air pressure: 86 kPa to 106 kPa

### 7.2 常规检验项目 Routine Inspection Items

序号 No.	项目 Items	试验要求 Test Requirements	参考标准 Reference Standards	抽样频率和 接受标准 AQL
1	外观 Appearance	壳体无穿孔,飞边;引线良好,无氧化发黑等情况。 The case without perforation, flash, the pin coating is good and no oxidative blackening.	ISO 2768-1 GB/T 1804	G-II, AQL=1.0
2	尺寸 Dimension	用游标卡尺测量引线外露长度·尺寸范围参照 4.1。 Use vernier caliper to measure the Pin out length, size range reference 4.1.	ISO 2768-1 GB/T 1804	S-2, AQL=0.65
3	压敏电压 Varistor Voltage	1 mA 的直流电流通过压敏电阻时测压敏电阻两端的电压·需满足在电压范围内。 The Voltage shall be to meet the specified value when it across the varistor measured at 1 mA of DC current.	IEC 61051	G-II, AQL=0.25
4	漏电流 Leakage Current	在 25 °C 温度下·施加 0.75 倍压敏电压时·测通过压敏电阻的电流 $\leq 20 \mu\text{A}$ 。 Measure the current passing through the varistor at 0.75Un, and at a temperature of 25 °C, the leakage current shall be no more than 20 $\mu\text{A}$ .	IEC 61051	G-II, AQL=0.25
5	介电耐压 Dielectric Voltage	在引脚和外壳间施加工频电压 $\geq 2500 \text{ V}$ ·1 分钟。 Subject the voltage no less than 2500 V, last for 1 minute between leads and enclosure.	IEC 61051	S-2, AQL=1.0
6	动作负载试验 Operating Duty Test	参见第 7 章节《检验》第 7.4 条 Reference 7.4 of the chapter 7 《Inspection》	IEC 61643-11 GB 18802.1	3 PCS/Lot AC=0
7	电压保护水平测试 Voltage Protection Level Test	参见第 7 章节《检验》第 7.5 条 Reference 7.5 of the chapter 7 《Inspection》	IEC 61643-11 GB 18802.1	3 PCS/Lot AC=0
8	异常过电压 限制电流测试 Limited Current Abnormal Overvoltage Test	参见第 7 章节《检验》第 7.6 条 Reference 7.6 of the chapter 7 《Inspection》	UL 1449	3 PCS/Lot AC=0

**电涌保护器 Surge Protective Devices**
**7.3 机械特性 Mechanical Performances**

项目 Items	试验方法 Test methods/conditions	参考标准 Reference Standards	抽样频率和 接受标准 AQL
拉力 Pull	<p>将待测试产品安装于测试架上,所有输入或输出导线从任意角度施加总重 89N(20 磅)的法码挂钩绑牢,受力时间 1 分钟,轻放法码。</p> <p>Install the product on the test shelf and tie all input or output lead wires respectively with 89N(20 lbf) weight from any angle for 1 minute. Then release the weights slightly.</p>	<p>IEC 61643-11 GB 18802.1</p>	<p>3 pcs/Lot,AC=0 导线不损伤、脱落。 The lead wires shouldn't be damaged.</p>

## 电涌保护器 **Surge Protective Devices**

### 7.4 动作负载试验 Operating Duty Test

测试方法：将防雷器接入测试端，冲击 2 次  $I_n$ （正、负极各 1 次）测试限制电压，若是回路中有 GDT 时再施加 1.2/50us 冲击电压 6kV/10 次（正、负极各 5 次）测试限制电压，再施加 15 次  $I_n$  冲击，分成 3 组，每组 5 次冲击。每次冲击应与电源频率同步。从  $0^\circ$  角开始，同步角应以  $30^\circ \pm 5^\circ$  的间隔逐级增加。两次冲击之间的间隔时间为 50s~60s，两组之间的间隔时间为 30min~35min。两组冲击之间试品无需施加电压。在施加每组冲击之后，需继续加电至少一分钟来检查复燃。在最后一组冲击和继续加电一分种后，SPD 保持加电，或在少于 30 秒内加电到  $U_c$ ，保持 15 分钟来检查稳定性。30 分钟后再重复进行测试限制电压的程序。

Test Method: Terminal wires of the SPD shall be subjected to one sequence of positive polarity and one sequence of negative polarity to determine the measured limiting voltage. If there is a GDT component in the circuit, 10 times of 1.2/50us, 6kV voltage impulse are applied to the SPD, five of positive and five of negative polarity to determine the measured limiting voltage. And then three groups of five impulses of 8/20 current impulses with positive polarity shall be applied. Starting from  $0^\circ$  the synchronization angle shall be increased in steps of  $30^\circ$  with a tolerance of  $\pm 5^\circ$  for each synchronization angle. The interval between the impulses is 50 s ~ 60 s, the interval between the groups is 30 min~35 min. It is not required that the test sample is energized between the groups. The SPD shall be energized at  $U_c$ . After the application of each group of impulses, the SPD shall remain energized without interruption for at least 1 min to check for reignition. After the last group of impulses and the 1 min period the SPD either remains applied or is reapplied within less than 30 s to  $U_c$  for another 15 min to check for stability. 30 minutes later, the SPD shall be subjected to sequences to determine the measured limiting voltage repeatedly.

判定标准：产品在测试中不能有可见可闻的损坏，测试前后限制电压的变化率 $<10\%$ 。

Pass Criteria: During and following the surge test, there shall not have visible or smelt (or both) damage, and the rate of the clamping voltage's variation shall be less than 10%.



## 电涌保护器 **Surge Protective Devices**

### 7.5 电压保护水平测试 Voltage Protection Level Test

测试方法：将防雷器接入测试端，冲击 2 次  $I_n$ （正、负极性各 1 次）测试限制电压；若是回路中有 GDT 时，应依次施加峰值约为 0.1；0.2；0.5；1.0  $I_n$  的 8/20us 冲击电流（正、负极性各 1 次）测试限制电压。若有  $I_{max}$  则  $I_n$  测试后再施加 2 次  $I_{max}$  冲击（正、负极性各 1 次）测试限制电压，若是回路中有 GDT 时，接着再施加 1.2/50us 冲击电压 6kV/10 次（正、负极各 5 次）测试限制电压，每次冲击的间隔时间应足以使试品冷却到环境温度。

Test Method: Terminal wires of the SPD shall be subjected to one sequence of positive polarity and one sequence of negative polarity to determine the measured limiting voltage ; If there is a GDT component in the circuit, 8/20 current impulses with a sequence of crest values of approximately 0,1; 0,2; 0,5; 1,0 times  $I_n$  shall be applied to determine the measured limiting voltage. When  $I_{max}$  is declared, then after  $I_n$  test, 2 times impulse of  $I_{max}$  (one time of positive and one of negative polarity) are applied to determine the measured limiting voltage. If there is a GDT component in the circuit, 10 times of 1,2/50us, 6kV voltage impulse are applied to the SPD, five of positive and five of negative polarity to determine the measured limiting voltage. After each impulse, the rest time should be let samples cooled to the ambient temperature.

判定标准：电压和电流波形图及目测检测试品应没有击穿或闪络的现象；试验过程中不应发生可见损害；不应对人体或设备产生爆炸或其他危险；试验后试品  $I_n$  测试时的限制电压值小于或等于  $U_p$ 。

Pass Criteria: Voltage and current records and visual inspection shall show no indication of puncture or flashover. No visible damage shall occur during the test. Values for measured limiting voltage after the test of  $I_n$  shall be below or equal to  $U_p$ .

## 电涌保护器 **Surge Protective Devices**

### 7.6 异常过电压限制电流测试 Limited Current Abnormal Overvoltage Test

测试方法：依 UL 1449 第四版中的图 44.2 所示，测试电压依 UL1449 4<sup>th</sup> 中的表 44.1 所示。将测试样品端短路，调节可变电阻，使测试电流分别为 0.125A、0.5A、2.5A、5A 和 10A 进行测试，测试时间为 7 小时，直至温度或电流达到平衡，或产品内部热脱扣断开电源。

Test Method: See the figure 44.2 in UL 1449 4<sup>th</sup> edition. The voltages in Table 44.1 shall be applied during the test. The power supply is to be incorporated with a series variable resistor that can be adjusted to obtain the short-circuit current: 0.125A、0.5A、2.5A、5A and 10A for testing. The samples are to be energized for 7 hours, or until current to, or temperatures within the SPD attain equilibrium, or until the SPD becomes disconnected from the ac supply.

判定标准:测试过程中产品不允许发出火焰,纱布起火和引燃外壳；测试后 5 分钟内内部的热脱扣装置接上电源在规定电压下测试的漏电流要求小于 0.5mA。

Pass Criteria: During the test, there shall be no emission of flame, flaming of the gauze or ignition of the enclosure ; within five minutes the in-built thermal-disconnector is connected to the ac supply, the SPD is applied with a specified voltage, and the leakage current must be less than 0.5mA.

## 电涌保护器 **Surge Protective Devices**

---

### 8 安装使用及维护 Installation and maintenance

#### 8.1 EZ20D(G)277M-L 用于主线保护,与主线串联使用。

EZ20D(G)277M-L for the main line protection, used series with the main line.

#### 8.2 EZ20D(G)277S-L 用于并联电源使用。

EZ20D(G)277S-L for parallel to power supply.

#### 8.3 不正确的安装可能会损坏 SPD 的性能，严格按照指示安装尤为重要。

Incorrect installation may damage the performance of the SPD, and it is especially important to follow the instructions.

#### 8.4 在开始安装程序之前，需用电表验证工作电压(AC 或 DC)，以确保工作电压符合要求。

Before starting the installation procedure, use the meter to verify the operating voltage (AC or DC) to ensure that the operating voltage meets the requirements.

#### 8.5 如果测量的电压超过电涌保护器的额定值，请勿安装 SPD。

Do not install SPD if the measured voltage exceeds the rating of the surge protector.

#### 8.6 安装前不要接入电力系统。

Do not connect the power system before installation.

#### 8.7 该电涌保护器在通电时 LED 灯应亮，如果 LED 灯不亮，说明电涌保护器已经损坏，需维修或更换。

The LED indicator should be light up when the surge protector is energized. If the LED indicator does not light, it indicates that the surge protector is damaged and needs to be repaired or replaced.


## 电涌保护器 Surge Protective Devices

### 9 标示及包装 Marks and Package

#### 9.1 本体标示 Product Body Marking:

例如 ex:

EZ20D277M-L

Lout		Nout	
			
EZ20D277M-L			
Rating : 277VAC 50 / 60Hz			
MCOV / Uc : 320V			
Uoc / Iow : 12kV / 6kA			
In : 5kA Imax : 10kA			
IL : 5A			
CE	T2	T3	T3
UL	CS	CCC	
Type: 4CA	IP67		
Lin		Nin	Gin
	MLV(V)	Up(V)	Up(V)
	L-N 1310	L-G 1200	N-G 1500
	L-G 1320	N-G 1200	1500
	N-G 1170	1200	1500

正视图 Front view




IEC61000-4-5		Up(V)
Uoc/Iow : 10kV / 5kA		L-N 1200
L-N : 2Ω, L-G / N-G : 12Ω		L-G 1200
		N-G 1200
		CQC Approval

上视图 Top view

#### 9.2 包装标签 Package Marking:

- 产品编号 ID NO
- 品名规格 Part NO
- 品种 Model
- 批号 Lot NO.
- 数量 Quantity
- 生产周期 Date Code

#### 9.3 包装 Packaging

<p>塑料泡壳 Plastic Tray (210×150×10mm) 12 PCS/ Plastic Tray</p>	
<p>内壳 Inner Box (250×168×70mm) 12 PCS/ 盒 Box</p>	
<p>外箱 Outside Box (350×260×150mm) 48 PCS/ 箱 Carton</p>	

-以下无正文 END