

## MG 系列电涌保护器 SPD MG Series

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## MG 系列电涌保护器 SPD MG Series

### 1 适用范围 Scope

EZ20MG277Z-S(C) 适用于 90~305V 交流电系统或者一般的电压驱动器和整流器。

外壳防护等级：IP67；

使用耐高温防火外壳。

温度范围：-40°C~105°C

EZ20MG277Z-S(C) are applied to 90~305VAC system or general voltage driver and rectifier.

Degree of protection provided by the enclosure：IP67；

Using the high temperature resistant and flameproof enclosure.

Temperature range：-40°C~105°C

防电涌等级：Surge protection level：

标称放电电流 Nominal surge current (In, 8/20μs)：In 20kA.

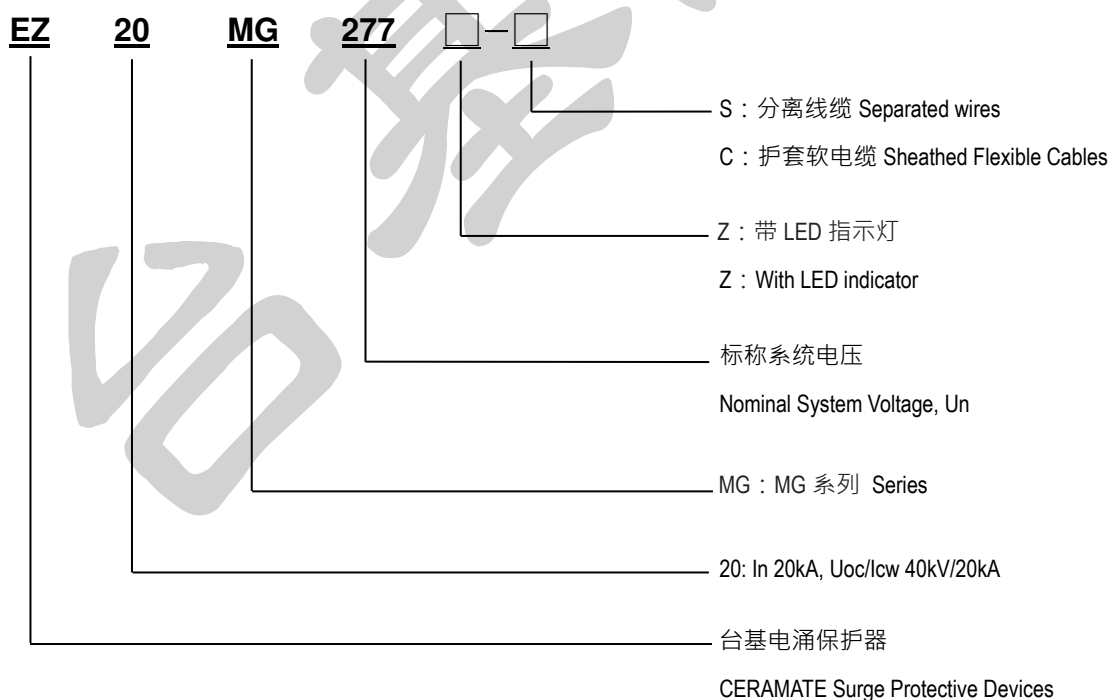
复合冲击波 Combination Impulse Wave [Uoc(1.2/50μs)/Icw(8/20μs)]：40kV/20kA.

### 2 术语 Glossary

参考标准 Reference Standards

IEC 61643-11:2011 · EN61643-11：2012 · IEC61643-1:2005 · GB/T 18802.1-2011

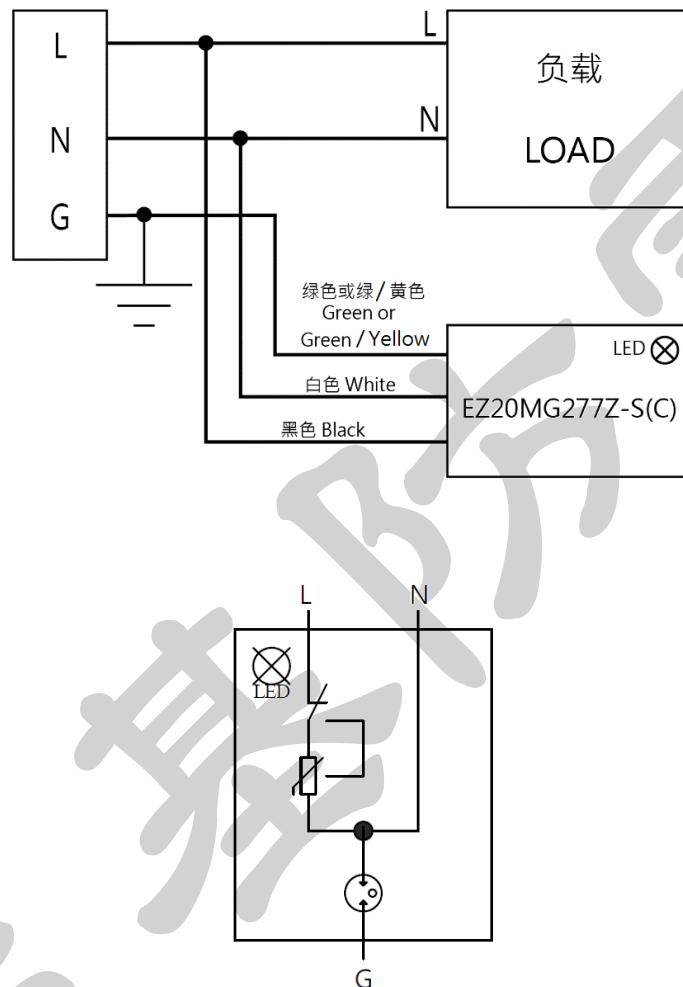
### 3 型号说明 Part Number System



# MG 系列电涌保护器 SPD MG Series

## 4 结构尺寸 Structure and Dimensions

### 4.1 应用示意图 Application Schematic

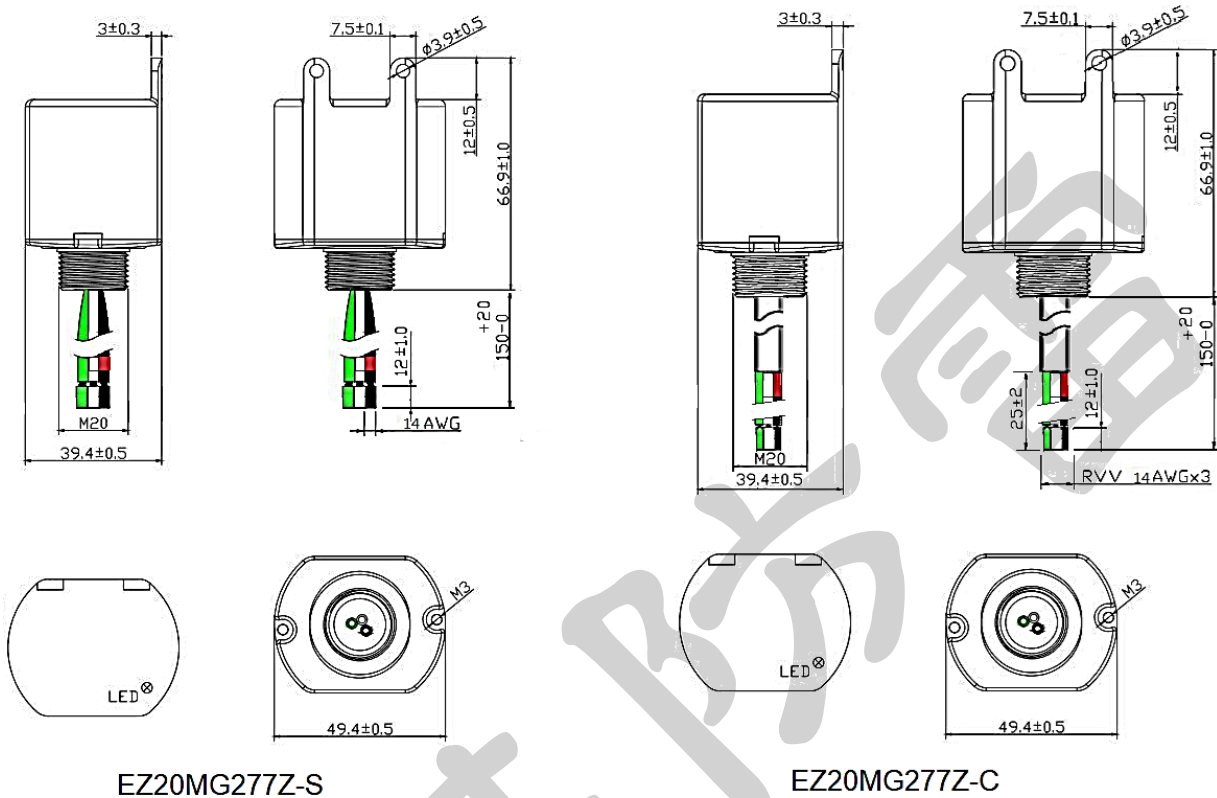


注: LED 常态有保护时亮。

Note: Under protected LED normally on.

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### 4.2 尺寸 Dimensions (mm)



EZ20MG277Z-S

EZ20MG277Z-C

#### 备注：

1. 线规：AWG14 号线。

电线颜色：火线：黑色，零线：白色，地线：绿色或绿/黄色，线长： $150^{+20}_{-0}$  mm。

2. EZ20MG277Z-S：分离线缆，尾端  $12 \pm 1.0$  mm 割开不去皮。距割开处约 15mm 套热缩套管，套管规格长 10mm，火线套管颜色为红色，标示“火进”，零线套管颜色为白色，标示“零进”。

EZ20MG277Z-C：护套软电缆，尾端外层割开去皮  $25 \pm 2$ mm，内层  $12 \pm 1.0$ mm 割开不去皮。距割开处约 3mm 套热缩套管，套管规格长 10mm，火线套管颜色为红色，标示“火进”，零线套管颜色为白色，标示“零进”。

#### Notes：

1. Wire Gauge：AWG14 wire.

Wire Color: Black: Line, White: Neutral, Green or Green/Yellow stripe: Ground. Wire length:  $150^{+20}_{-0}$  mm.

2. EZ20MG277Z-S：Separated wires, cutting on  $12 \pm 1.0$  mm from tail terminals but not stripping. A 10 mm length heat-shrinkable tube is sleeve on the position about 15mm from the cutting position. The tubing color of line is red, and marking as “火进”, The tubing color of neutral is white, and marking as “零进”.


EZ20MG277Z-C：Sheathed flexible cable, Jacket cutting on  $25 \pm 2$ mm from tail terminal and stripping, Internal wires cutting on  $12 \pm 1.0$ mm from tail terminals but not stripping. A 10 mm length heat-shrinkable tube is sleeve on the position about 3 mm from the cutting position. The tubing color of line is red, and marking as “火进” The tubing color of neutral is white, and marking as “零进”.

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**5 技术参数 Specifications**

产品型号 Product Model	EZ20MG277Z-S(C)	
温湿度范围 Temperature and Humidity Range	温度：-40°C至 105°C/湿度：5%至 95%RH Temperature：-40°C~105°C/ Humidity：5%~95% RH	
端口数量 Number of Ports	一端口,仅输入 one port, only input	
配电系统 Power Distribution System	TN	
标称系统电压 Nominal System Voltage, Un	90-305 VAC	
最大连续工作电压 Maximum Continuous Operating Voltage, Uc	320V AC	
工作频率 Working Frequency	50/60HZ	
复合冲击波 Combination Impulse Wave Uoc (1.2 / 50 us )/Icw ( 8 / 20 us )	40kV/20kA	
标称放电电流 Nominal Discharge Current, In (8/20us)	20kA	
最大放电电流 Maximum Discharge Current, Imax (8/20us)	40kA	
电压保护水平 Voltage Protection Level, Up (V)	L-N	2500V
	L-G	2500V
	N-G	2500V
安全失效模式 Safe Failure Mode	开路模式 Open Circuit Mode (OCM)	
暂态过电压特性,用户装置内的 低压系统故障 Temporary Overvoltage (TOV) Characteristic, LV-system faults	(1) 335 Vac,5 秒,耐受模式 5 sec, withstand mode (2) 440 Vac,120 分钟,耐受或安全失效模式 120min, withstand mode or safe failure mode	
预期短路电流 Prospective short-circuit current, I (A)	300	
脱离器动作指示 Indication of Disconnector Operation	LED 指示灯由亮变灭,AC 电源断开 LED indicator from light on to light off, and AC network cut-off	
外壳防护等级 Ingress Protection Level	IP67	
额定断开续流值 Follow current Interrupting Rating	N-G 模式 20A N-G mode 20A	

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### 6 安规认证 Agency Approvals

认证机构 Agency		标准 Standards	认证号 File NO.	类别 Category	执行标准 Designed to Standards
	TUV	IEC 61643-11:2011	R50415533	Class II	<ul style="list-style-type: none"> <li>● UL 1449 4<sup>th</sup> Ed : 2014</li> <li>● IEC 61643-11 : 2011</li> <li>● EN 61643-11 : 2012</li> <li>● IEC 61000-4-5 : 2014</li> <li>● IEEE C62.41.2-2002</li> </ul>
	TUV	EN 61643-11:2012	HU-002372	Class II	

### 7 检验 Inspection

#### 7.1 大气条件 Atmospheric Conditions

温度 Temperature : 5 °C - 35 °C

相对湿度 Relative Humidity : 25%-75%

大气压力 Air pressure: 86 kPa to 106 kPa

#### 7.2 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>	IEC 61643-11 GB 18802.1	<p>3 pcs/Lot,AC=0</p> <p>导线不损伤、脱落。</p> <p>The lead wires shouldn't be damaged.</p>

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### 7.3 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;引脚镀层良好·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	用游标卡尺测量引脚外露长度·尺寸范围参照 4.2。 Use vernier caliper to measure the wires out length, size range reference 4.2.	ISO 2768-1 GB/T 1804	S-2, AQL=0.65
3	介电耐压 Dielectric Withstand	在引脚和外壳间施加工频电压 $\geq 2200$ V·1 分钟,不应发生闪络和击穿。 Subject the voltage no less than 2200 V, last for 1 minute between leads and enclosure, arcing or puncturing shall not occur.	IEC 61643-11 GB 18802.	S-2, AQL=1.0
4	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
5	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
6	暂态过电压特性, 低压系统故障 Temporary Overvoltage (TOV) Characteristic, LV-system faults	参见第 7 章节《检验》第 7.6 条 Reference 7.6 of the chapter 7 《Inspection》	IEC 61643-11 GB 18802.1	3 PCS/Lot AC=0

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### 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 1.2/50 $\mu$ s 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°角开始，同步角应以 30° $\pm$ 5°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 1.2/50 $\mu$ s, 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° the synchronization angle shall be increased in steps of 30° with a tolerance of  $\pm$  5° 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%.



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### 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  $U_p$ .

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### 7.6 暂态过电压下的性能试验. Behaviour under temporary overvoltages (TOVs).

#### 低压系统故障. Low voltage system faults。

测试方法：SPD 试品应连接到  $U_T$  的工频电压，持续时间为  $t_T$  秒。 $U_T$  电源应能输出足够大的电流，以确保在试验过程中 SPD 端子上的电压不会跌落低于  $U_T$  的 5%。紧接着在施加  $U_T$  后，应在试品上施加等于  $U_{REF}$  并具有同样电流能力的电压 15 分钟。试验周期之间的时间间隔应尽可能短，并且在任何情况下不应超过 100ms。

TOV 试验参数：(1) 335 Vac，5 秒，耐受模式。

(2) 440 Vac，120min，耐受或安全失效模式。

Test Method: The test sample shall be connected to a power frequency voltage of  $U_T$  for a duration  $t_T$  seconds. This power source for  $U_T$ , shall be capable of delivering a current high enough to ensure that the voltage at the SPD terminals does not fall below  $U_T$  by more than 5% during the test. Immediately following the application of  $U_T$ , a voltage equal to  $U_{REF}$  with the same current capability, shall be applied to the test sample for a period of 15 min. The time interval between the test periods shall be as short as possible and shall in any case not exceed 100 ms.

TOV Test Parameters：(1) 335 Vac，5 Sec，withstand mode。

(2) 440 Vac，120min，withstand or safe failure mode。

判定标准：必须达到热稳定。试品应没有击穿或闪络的迹象。试验过程中不应发生可见的损害。试验后检查发现的细小的凹痕或裂缝如不影响防直接接触，则可以忽略。试验后试品上不应有燃烧的痕迹。试验时内部脱扣装置不应动作；试验后脱扣装置应处在正常工作状态。

Pass Criteria: Thermal stability shall be achieved. The sample shall show no indication of puncture or flashover. No visible damage shall occur during the test. After the test, small indents and cracks not impairing the protection against direct contact are disregarded during this check. There shall be no visual evidence of burning of the sample after the test. Internal disconnectors shall not operate during the test and shall be in working order after the test.

## MG 系列电涌保护器 SPD MG Series

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

8.1 EZ20MG277Z-S(C) 并联接法,一端口,仅输入。

EZ20MG277Z-S(C) Parallel connection, one port, only input

8.2 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.

8.3 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.

8.4 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.

8.5 安装前不要接入电力系统。

Do not connect the power system before installation.

8.6 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.

### 9 标示 Marks

本体标示 Product Body Marking:

例如 ex:

