

1 適用範圍 Scope

EZ10MF277S(M)-S(C)-(M), 適用於 90V~305V AC 交流電系統。

防電湧等級:

IEC 61643-11: 複合衝擊波(Uoc/lcw) , 10kV/5kA;

IEC 61000-4-5: 安裝於受試設備後, 複合波衝擊波(Uoc/lcw) , 10kV/5kA L-N 差模 2 ohm , L-G/N-G 共模 12 ohm。

溫度範圍: -40°C ~ 125°C

外殼防護等級: IP67; 使用耐高溫防火外殼

EZ10MF277S(M)-S(C)-(M), are apply to 90V~305V AC system. Surge protection level:

IEC 61643-11: Combination impulse wave, 10kV/5kA;

IEC 61000-4-5: After installed in EUT, combination impulse wave, 10kV/5kA.

L-N differential mode 2 ohm , L-G/N-G common mode 12ohm.

Temperature: -40°C ~ 125°C.

Degree of protection provided by the enclosure: IP67; Using high temperature resistant and flameproof enclosure

2 術語 Glossary

參考標準 Reference Standards

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

UL1449 4th ed.: 2014

3 型號說明 Part Number System

EZ 10 MF 277 - **(M)**

空白: 河地 GDT

To Ground with GDT

M: 河地 GDT+MOV

To Ground with GDT+MOV

導線型式 Leads Type

C: 護套軟電纜 Sheathed Flexible Cables S:

分離線纜 Separated wires

配電方式 Wiring Configuration

S: 並聯接法 Parallel Connection

M: 串聯接法 Series Connection

標稱系統電壓

Nominal System Voltage, Un

MF 系列 MF Series: TcoMOV+PCB

提升暫態過電壓保護能力

Promoting TOV Protection Capability

複合衝擊波

依照 IEC 61643-11: 2011

第三類複合波試驗

Combination Impulse Wave

In accordance with IEC 61643-11: 2011

Class III combination

wave tests Uoc / lcw:

10kV / 5Ka

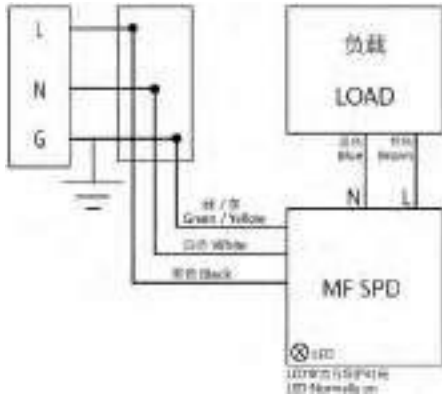
ACPA 電湧保護器

CERAMATE Surge Protective Devices

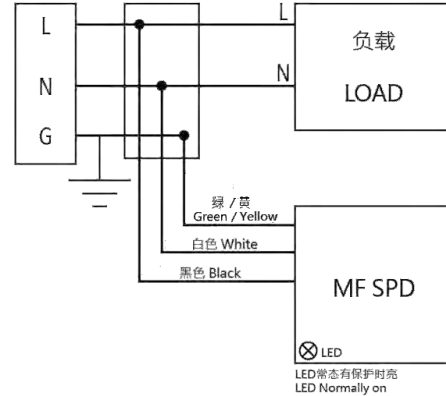
4 結構尺寸 Structure and Dimensions

4.1 應用示意圖 Application Schematic

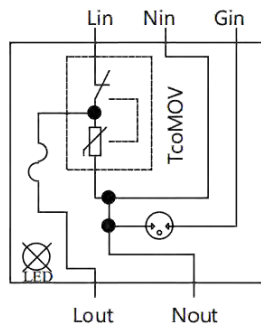
串聯接法 Series Connection



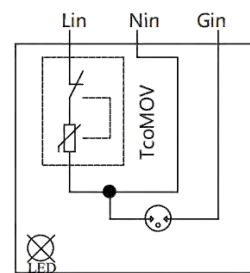
並聯接法 Parallel Connection



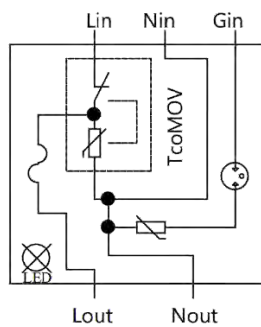
EZ10MF277M-S(C)



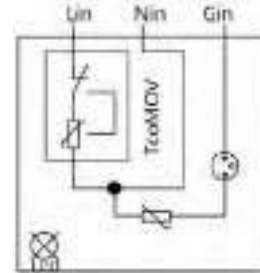
EZ10MF277S-S(C)



EZ10MF277M-S(C)-M



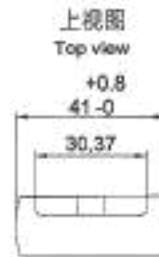
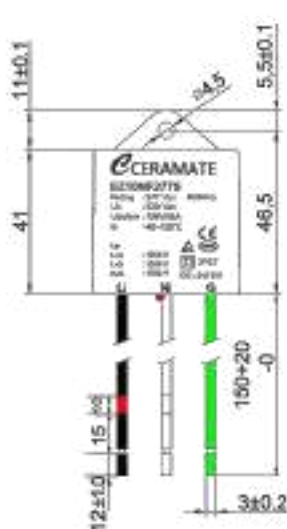
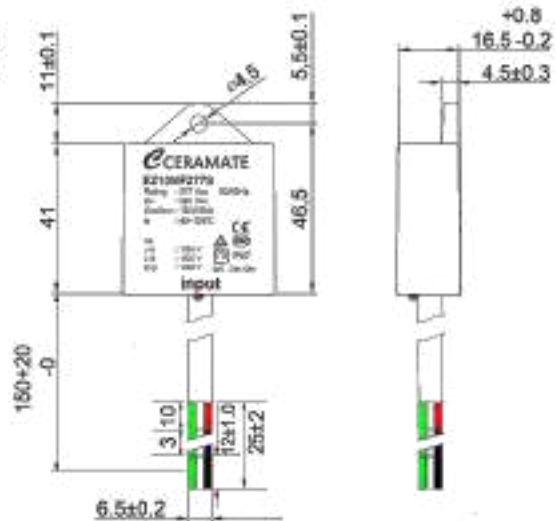
EZ10MF277S-S(C)-M



備註: 1. LED 常態有保護時亮。

Note: 1. Under protected LED normally on.

4.2 尺寸 Dimensions (mm)
EZ10MF277M(S)-S(C)

EZ10MF277M(S)-S(C)-M

**塑膠壳裝灌膠防水型(分離線纜)
Plastic casing and potting, waterproof(Separed wires)
EZ10MF277S-S-(M)**

**塑膠壳裝灌膠防水型(护套軟電纜)
Plastic casing and potting, waterproof(Sheathed Flexible Cable)
EZ10MF277S-C-(M)**

備註：

1. 線規:AWG18 號。

電線顏色：火線：黑色，零線：白色，地線：綠/黃色，線長：150⁺²⁰₋₀ mm。

2. EZ10MF277S-S-(M)：分離線纜，尾端 12.0±1.0 mm 割開不去皮，距割開處約 15mm 套熱縮套管,套管規格長 10mm,火線套管顏色為紅色,標示“火進”，零線套管顏色為白色,標示“零進”。

EZ10MF277S-C-(M)：護套軟電纜，尾端外層割開去皮 25±2mm, 內層 12.0±1.0mm 割開不去皮,距割開處約 3mm 套熱縮套管,套 規格長 10mm,火線套管顏色為紅色,標示“火進”，零線套管顏色為白色,標示“零進”。

Notes：

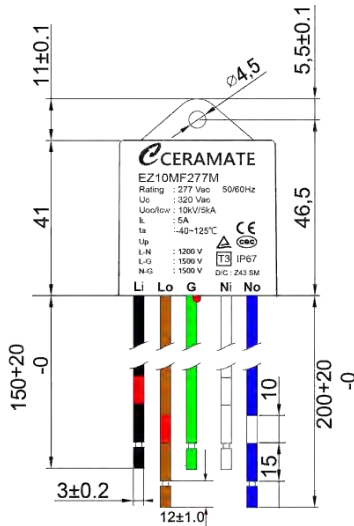
1. Wire Gauge：AWG18 wire.

Wire Color: Black: Line, White：Neutral, Green/Yellow：Ground. Wire length：150⁺²⁰₋₀ mm.

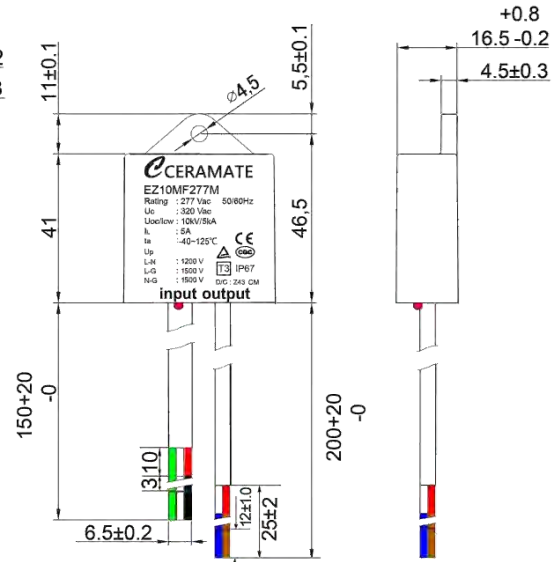
2. EZ10MF277S-S-(M)：Separated wires, cutting on 12.0±1.0 mm from tail terminals but not stripping. A 10 mm length heat-shrinkable tube is sleeve on the position about 15mm from the cutting position .The tubing color of line is red, and marking as “火進”，The tubing color of neutral is white, and marking as “零進”。

EZ10MF277S-C-(M)：Sheathed flexible cable、Jacket cutting on 25±2mm from tail terminal and stripping, Internal wires cutting on 12.0±1.0mm from tail terminals but not stripping. A 10 mm length heat-shrinkable tube is sleeve on the position about 3mm from the cutting position .The tubing color of line is red, and marking as “火進” The tubing color of neutral is white, and marking as “零進”。

塑膠壳裝灌膠防水型(分離線纜)
Plastic casing and potting, waterproof(Separated wires)
EZ10MF277M-S-(M)



塑膠壳裝灌膠防水型(护套軟電纜)
Plastic casing and potting, waterproof(Sheathed Flexible Cable)
EZ10MF277M-C-(M)



備註：

1. 線規：AWG18 號線

電線顏色：輸入：火線：黑色，零線：白色，地線：綠/黃色，線長：150⁺²⁰₋₀ mm。

輸出：火線：棕色，零線：藍色，線長：200⁺²⁰₋₀ mm。

2. EZ10MF277M-S-(M)：分離線纜，尾端 12.0±1.0 mm 割開不去皮，距割開處約 15mm 套熱縮套管，套管規格長 10mm，火線套管顏色為紅色，標示“火進”或“火出”，零線套管顏色為白色，標示“零進”或“零出”。

EZ10MF277M-C-(M)：護套軟電纜，尾端外層割開去皮 25±2mm，內層 12.0±1.0mm 割開不去皮，距割開處約 3mm 套熱縮套管，套管規格長 10mm，火線套管顏色為紅色，標示“火進”或“火出”，零線套管顏色為白色，標示“零進”或“零出”。

Notes：

1. Wire Gauge：AWG18 wire

Wire Color：Input：Black：Line White：Neutral, Green/Yellow：Ground Line length：150⁺²⁰₋₀ mm.

Output：Brown：Line Blue：Neutral Line length：200⁺²⁰₋₀ mm.

2. EZ10MF277M-S-(M) Separated wires cutting on 12.0±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 “火進” or “火出”，The tubing color of neutral is white, and marking as “零進” or “零出”.

EZ10MF277M-C-(M)：Sheathed flexible cable. Jacket cutting on 25±2mm from tail terminal and stripping Internal wires cutting on 12.0±1.0mm from tail terminals but not stripping. A 10 mm length heat-shrinkable tube is sleeve on the position about 3mm from the cutting position. The tubing color of line is red, and marking as “火進” or “火出”，The tubing color of neutral is white, and marking as “零進” or “零出”.

5 技術參數 Specifications

產品型號 Product Model	EZ10MF277S-S(C)	EZ10MF277M-S(C)	EZ10MF277S-S(C)-M	EZ10MF277M-S(C)-M
溫濕度範圍 Temperature and Humidity Range	溫度：-40℃至 125℃/ 濕度：5%至 95%RH Temperature：-40℃ to 125℃ / Humidity：5%~95% RH			
埠數量 Number of Ports	一埠,僅輸入 one port, only input	一埠,輸入/輸出 one port, input/output	一埠,僅輸入 one port, only input	一埠,輸入/輸出 one port, input/output
配電系統 Power Distribution System	TN			
標稱系統電壓範圍 Nominal System Voltage Range, Un	90~305VAC			
最大連續工作電壓 Maximum Continuous Operating Voltage,	320VAC			
工作頻率 Working Frequency	50/60 Hz			
複合衝擊波, IEC 61643-11 Combination Impulse Wave Uoc (1.2 / 50 us)/Icw (8 / 20 us) 備註 1 Note 1	10kV / 5kA			
電壓保護水準 Voltage Protection Level, Up (V)	L-N	1200		
	L-G	1500		
	N-G	1500		
額定負載電流 Rated Load Current, I _L (A)	—	5	—	5
安全失效模式 Safe Failure Mode	開路模式 Open Circuit Mode (OCM)			
暫態過電壓特性, 低壓系統故障 Temporary Overvoltage (TOV) Characteristic, LV-system Faults	1) 335 Vac, 5 秒, 耐受模式 5 sec, withstand mode (2) 440 Vac, 120 分鐘, 耐受或安全失效模式 120min, withstand mode or safe failure mod			
預期短路電流 Prospective Short-circuit Current, I _{sc} (A)	300			
脫離器動作指示 Indication of Disconnect Operation	LED 指示燈由亮變滅, AC 電源斷開. LED 常態有保護時亮. LED indicator from light on to light off, and AC network cut-off. Under protected LED normally on.			
外殼防護等級 Ingress Protection Level	IP67			
額定斷開續流值 Follow current Interrupting Rating	N-G 模式 20A N-G mode 20A		—	

備註 1: 電湧保護器安裝於受試設備後, 依照 IEC61643-11 : 2011, 回類, 或依照 IEC 61000-4-5 : 2014

- 測試波形: 複合波; 同一只產品同時滿足, 差模: L-N, 10kV/5kA, 2 ohm, 共模: L-G / N-G, 10 kV / 833 A, 12ohm, 浪湧次數 (河各耦合路徑): 應分別在 0°, 90°, 180° 與 270° 相角施加正、負極性各 5 次; 連續脈衝間的時間間隔: 1 分鐘或更短; 耦合阻抗: 差模 18 μ F, 共模 9 μ F + 10 Ω 。

Note 1: After installed SPD in EUT, in according to IEC 61643-11 : 2011, class III, or in according to IEC 61000-4-5 : 2014, test waveform: combination wave; the same sample be satisfied to, Differential mode : L-N 10kV/5Ka.2 ohm, Common mode : L-G / N-G, 10 kV / 833 A, 12ohm, 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 μ F, common mode 9 μ F + 10 Ω .

6 安規認證 Agency Approvals

認證機構 Agency	標準 Standards	認證號 File NO.	類別 Category	執行標準 Designed to Standards
 CQC	GB/T18802.1-2011	CQC19123218316	III類 Class III	GB18802.1-2011 UL 1449 4th Ed : 2014 IEC 61643-11 : 2011 EN 61643-11 : 2012 IEC 61000-4-5 : 2014 IEEE C62.41.2-2002
 TUV	EN 61643-11 : 2012	R50439388	III類 Class III	
 TUV	IEC 61643-11 : 2011	HU-002607	III類 Class III	
 TUV	EN 61643-11 : 2012	R50439388	III類 Class III	

7 檢驗 Inspection

7.1 大氣條件 Atmospheric

Conditions 溫度 Temperature:

5 °C - 35 °C 相對濕度 Relative

Humidity : 25%-75%

大氣壓力 Air pressure: 86 kPa to 106kPa

7.2 機械特性 Mechanical Performances

項目 Items	試驗方法 Test methods/conditions	參考標準 Reference	抽樣頻率和 接受標準 AQL
拉力 Pull	將待測試產品安裝於測試架上,所有輸入或輸出導線從任意角度施加總重 89N(20 磅)的法碼掛鉤綁牢,受力時間 1 分鐘,輕放法碼。 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.	IEC 61643-11 GB 18802.1	3 pcs/Lot, AC=0 導線不損傷、脫落。 The lead wires shouldn't be damaged.

7.3 常規檢驗專案 Routine Inspection Items

序號 No.	項目 Items	試驗要求 Test Requirements	參考標準 Reference Standards	抽樣頻率和 接受標準 AQL
1	外觀 Appearance	殼體無穿孔,飛邊;引腳鍍層良好,無氧化發黑等情況。 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	用遊標卡尺測量引腳外露長度,尺寸範圍參照 4.2。 Use vernier caliper to measure the Pin out length,size range reference 4.2.	ISO 2768-1 GB/T 1804	S-2, AQL=0.65
3	介電耐壓 Dielectric Withstand	在引腳和外殼間施加工頻電壓 $\geq 2200\text{ V}$, 1 分鐘,不應該發生閃絡和击穿 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 18802.1	S-2, AQL=1.0
4	動作負載試驗 Operating Duty Test	參見第 7 章節《檢驗》第 7.4 條 Reference 7.4 of the chapter 7 《Inspection》	IEC 61643-11 GB 18802.1	3 PCS/Lot AC=0
5	電壓保護水準測試 Voltage Protection Level Test	參見第 7 章節《檢驗》第 7.5 條 Reference 7.5 of the chapter 7 《Inspection》	IEC 61643-11 GB 18802.1	3 PCS/Lot AC=0
6	暫態過電壓特性, 低壓系統故障 Temporary Overvoltage (TOV) LV-system faults	參見第 7 章節《檢驗》第 7.6 條 Reference 7.6 of the chapter 7 《Inspection》	IEC 61643-11 GB 18802.1	3 PCS/Lot AC=0

7.4 動作負載試驗 Operating Duty Test

測試方法：將防雷器接入測試端，衝擊 2 次 U_{oc} （正、負極各 1 次）測試限制電壓，再施加 15 次 U_{oc} 衝擊，分成 3 組，每組 5 次衝擊。兩次衝擊之間的間隔時間為 50s~60s，兩組之間的間隔時間為 30min。兩組衝擊之間試品無需施加電壓。在施加每組衝擊之後，需繼續加電至少一分鐘來檢查複燃。在最後一組衝擊和繼續加電一分鐘後，SPD 保持加電，或在少於 30 秒內加電到 U_c ，保持 15 分鐘來檢查穩定性。30 分鐘後再重複進行測試限制電壓的程式。

Test Method: Terminal wires of the SPD shall be subjected to one sequence of positive polarity and one sequence of negative polarity at U_{oc} to determine the measured limiting voltage. And then three groups of five impulses of U_{oc} impulses with positive polarity shall be applied. The interval between the impulses is 50 s ~ 60 s, the interval between the groups is 30 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.

判定標準：產品在測試中不能有可見可聞的損壞，測試前後限制電壓的變化率 $<10\%$ 。

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%.

7.5 電壓保護水準測試 Voltage Protection Level Test

測試方法：將防雷器接入測試端，衝擊 4 次 U_{oc} （正、負極性各 2 次）測試限制電壓；若是回路中有 GDT 時，應依次施加峰值約為 0.1;0.2; 0.5; 1.0 的 U_{oc} 衝擊電壓（正、負極性各 2 次）測試限制電壓。每次衝擊的間隔時間應足以使試品冷卻到不境溫度。

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 two 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. After each impulse, the rest time should be let samples cooled to the ambient temperature.

判定標準：電壓和電流波形圖及目測檢測試品應沒有古穿或閃絡的現象，試驗過程中不應發生可見損害；不應河人員或設備產生爆炸或其他危險；試驗後試品 U_{oc} 測試時的限制電壓值小於或等於 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 U_{oc} shall be below or equal to U_p .

7.6 暫態過電壓下的性能試驗. Behavior under temporary overvoltage (TOV).

低壓系統故障. Low voltage system faults。

測試方法:SPD 試品應連接到 U_T 的工頻電壓, 持續時間為 t_T 秒。 U_T 電源應能輸出足夠大的電流, 以確保在試驗過程中 SPD 端子上的電壓不會跌落低於 U_T 的 5%。緊接著在施加 U_T 後, 應在試品上施加等於 U_{REF} 並具有同樣電流能力的電壓 15 分鐘。試驗週期之間的時間間隔應足可能短, 並且在任何情況下不應超過 100ms。

TOV 試驗參數: (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 100ms.

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

(2) 440 Vac, 120min, withstand or safe failure mode。判定標準: 必須達到熱穩定。試品應沒有古穿或閃絡的跡象。試驗過程中不應發生可見的損害。

試驗後檢查發現的細小的凹痕或裂縫如不影響防直接接觸, 則可以忽略。試驗後試品上不應有燃燒的痕跡。試驗時內部脫扣裝置不應動作; 試驗後脫扣裝置應處在正常工作狀態。

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.

8 安裝使用及維護 Installation and maintenance

8.1 EZ10MF277M-S(C)-(M) 串聯接法,一埠,輸入/輸出。

EZ10MF277M-S(C)-(M) Series connection one port, input/output. EZ10MF277S-S(C)-(M) 並聯接法,一埠,僅輸入

EZ10MF277S-S(C)-(M) Parallel connection, one port, only input

8.2 不正確的安裝可能會損壞 SPD 的性能, F 格按照指示安裝尤為重要。

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

8.3 在開始安裝程式之前,需用電錶驗證工作電壓(AC 或 DC),以確保工作電壓符合要求。

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 如果測量的電壓超過電湧保護器的額定值,請勿安裝 SPD。

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

8.5 安裝前不要接入電力系統。

Do not connect the power system before installation.

8.6 該電湧保護器在通電時 LED 燈應亮,如果 LED 燈不亮,說明電湧保護器已經損壞,需維修或更換。

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 標示 Marks

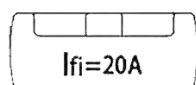
本體標示 Product Body Marking:

例如 ex:

EZ10MF277M(S)-S(C)

EZ10MF277M(S)-S(C)-M

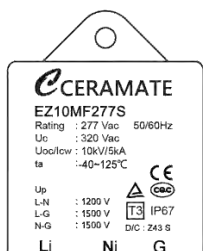
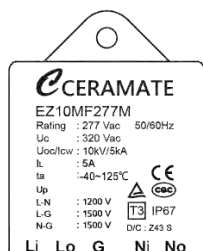
上视图
Top view



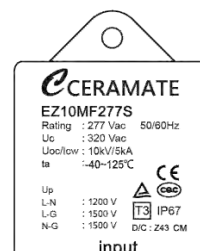
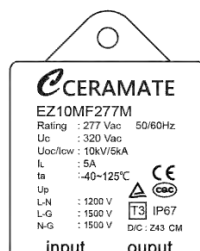
上视图
Top view



分离线缆
Separated wires



护套软电缆
Sheathed Flexible Cable



10. 包裝 Packaging

塑膠殼裝灌膠防水型

Plastic casing and
potting, waterproof
(350×260×150mm)

120 PCS/紙箱 Carton

