1 適用範圍 Scope

EZ20D(G)277M(S)-L (G)適用於 90V~305V 交流電系統或者一般的電壓驅動器和整流器。 電湧保護等級:
標稱放電電流 In:5kA/最大放電電流 Imax:10kA (8/20μs);
複合衝擊波 Uoc=12kV (1.2/50μs)
使用耐高溫防火外殼; IP67。

EZ20D(G)277M(S)-L (G) is applicable for 90V~305VAC system or general voltage driver and rectifier, Surge protection level=In 5kA / Imax=10kA (8/20μs) ;
Combination Impulse Wave Uoc=12kV (1.2/50 μs)
Using the high temperature resistant and flameproof enclosure, IP 67.

2 術語 Glossary

參考標準 Reference Standards
UL1449 第四版 2014, IEC 61643-11=2011, IEC61643-1=2005, EN61643-11=2012
GB/T18802.1-2011

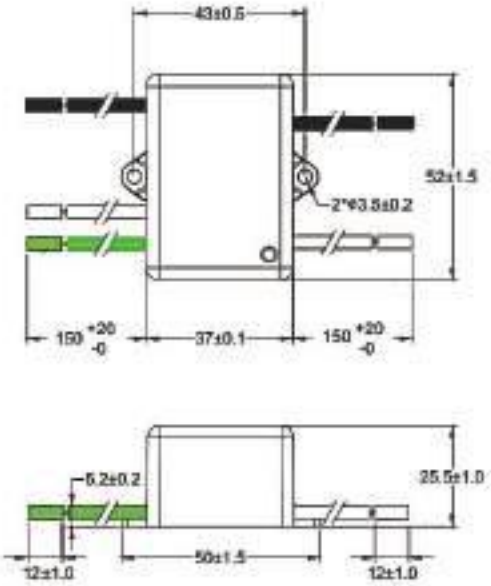
3 型號說明 Part Number System

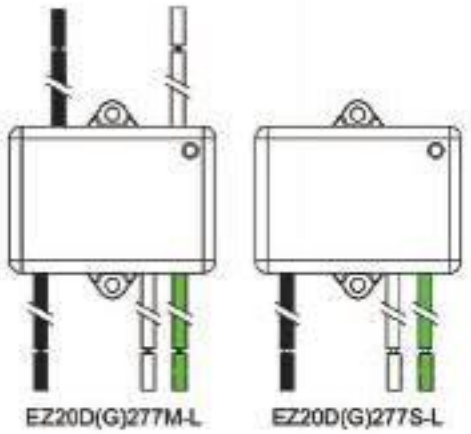
EZ 20 D(G) 277 M(S) -L

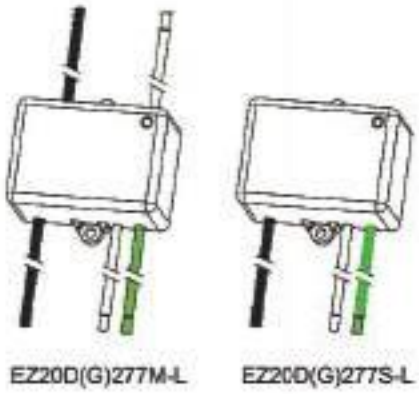
- -L: 路燈、Roadway Lighting
- M(S): 配電方式 WiringConfiguration
  M:串聯接法 Series connection
  S :並聯接法 Parallel connection
- 277: 標稱系統電壓
  Nominal System Voltage,Un
- D(G): D:三角形接法△ Connection
  DG：三角形接法加放電管
  △Connection with GDT
- 20: 壓敏尺寸名義上、MOV Nominal Size 20 mm
- EZ: ACPA 電湧保護器
  CERAMATE Surge ProtectiveDevices

4 結構尺寸 Structure and Dimension

4.1 Dimensions(mm)







注意

線規:AWG14 號線；輸入線長度 150 $^{+20}_{-0}$ mm，輸出線長度 150 $^{+20}_{-0}$ mm，線尾端 12±1.0mm 割開不去皮。

電線顏色:輸入:火線　黑色，零線　白色，地線　綠色，

輸出:火線　黑色，零線　白色，

Notes:

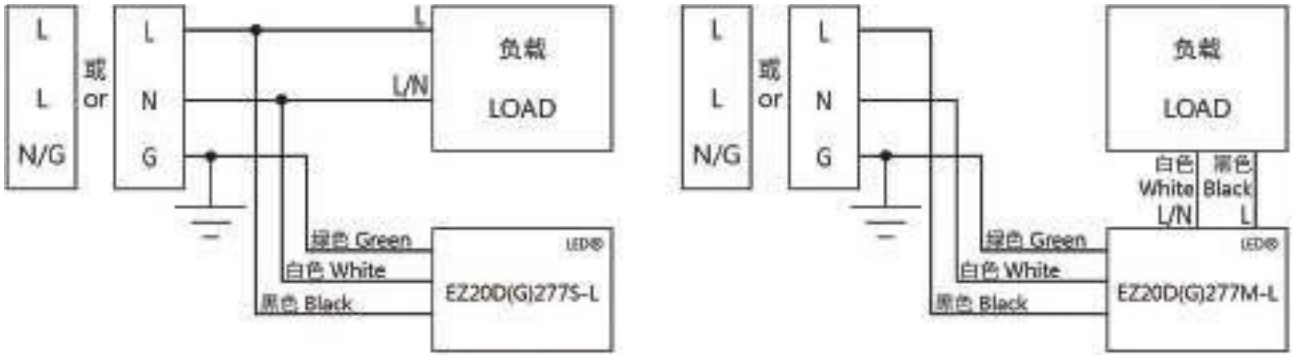
Wire Gauge：AWG14 wire;

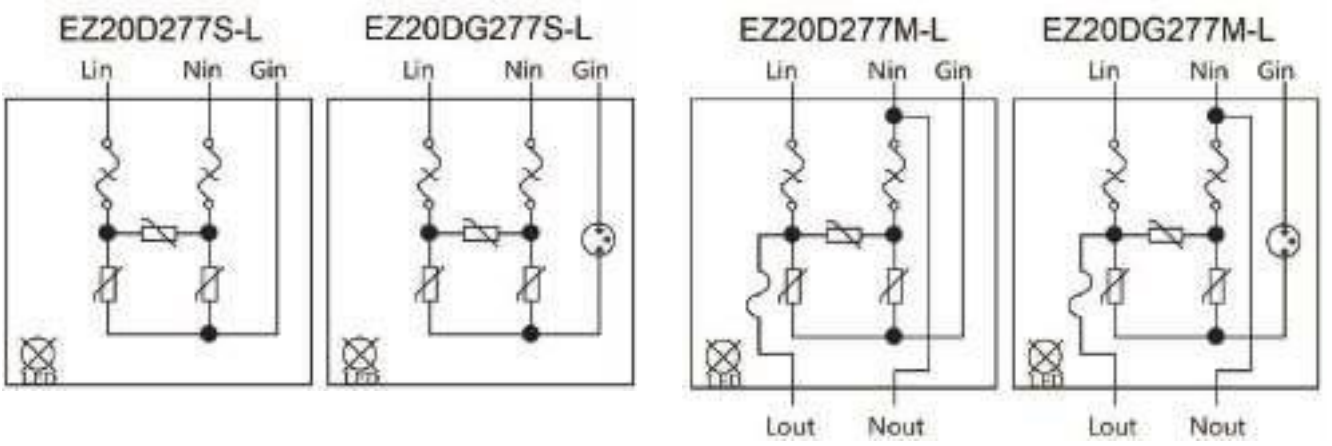
Wire Gauge：150mm or customized, cutting lead wires on 12±1.0mm from tail terminals but not stripping

Input：Black:Line. White:Neutral, Green:Ground. Line length:150$^{-20}_{-0}$mm.

Output：Black:Line. Blue:Neutral. Line length: 150$^{-20}_{-0}$mm

4.2 應用視意圖 Application Schematic





備註 : 1.LED 常態有保護時亮。

Note: 1.Under protected LED normally on.

5 安規認證

認證機構 Agency		標準 Standards	認證號 File No.	類別 Category
	UL	UL 1449 4th	E315429	VZCA2 4CA 類 Type 4CA
	UL	CSA C22.2 NO.269.5-17	E315429	VZCA2 4CA 類 Type 4CA
	UL	IEC 61643-11	E483592	VZCC II類 Class II III類 Class III
	UL (Demko)	IEC 61643-11	DK-71934-M1-UL	II類 Class II III類 Class III
	UL	GB 18802.1-2011	CQC19123227711	II類 Class II

6 技術參數 Specifications

產品型號 Product Model		單位 Unit	EZ20D277S-L	EZ20DG277S-L	EZ20D277M-L	EZ20DG277M-L
溫濕度範圍 Temperature and Humidity Range			安規認證 溫度：-40℃至85℃ 濕度：5%至 95%RH Agency approval Temperature：-40℃ to 85℃/ Humidity：5%~95% RH		安規認證 溫度：-40℃至70℃ 濕度：5%至 95%RH Agency approval Temperature：-40℃ to 70℃/ Humidity：5%~95% RH	
			擴展技術參數 溫度：-40℃至 105℃/ 濕度：5%至 95%RH Extended technical data Temperature：-40℃ to 105℃ /			
標稱系統電壓 Nominal System Voltage, Un		Vac	90~305			
最大連續工作電壓 Maximum Continuous Operating Voltage, Uc		Vac	320			
工作頻率 Working Frequency		Hz	50/60			
標稱放電電流 Nominal Discharge Current, In(8/20us)		kA	5			
複合衝擊波 Combination Impulse Wave Uoc (1.2 / 50 us) *備註 2 *Note 2		kV	12			
最大放電電流 Maximum Discharge Current, Imax (8/20us)		kA	10			
測量限制電壓 Measured Limiting Voltage, MLV UL 認證適用 Suitable for UL Approval	L-N	V	1250	1250	1310	1320
	L-G	V	1310	1780	1320	1750
	N-G	V	1220	1810	1170	1620
電壓保護水準 Voltage protection level, Up CE,CB,T2 認證適用	L-N	V	1200	1200	1200	1200
	L-G	V		1800		1800
	N-G	V				
電壓保護水準 Voltage protection level, Up CE,CB,T3 認證適用	L-N	V	1300	1300	1500	1500
	L-G	V		2900		2900
	N-G	V				
電壓保護水準 Voltage protection level, Up CQC, T2 認證適用 0 Suitable for CQC, T2 Approval	L-N	V	1400	1300	1200	1200
	L-G	V		2000		2000
	N-G	V				
額定負載電流 Rated Load Current, IL		A	—		5	
防護等級 Ingress Protection Level			IP67			

備註 1＝EZ20DG 型號在共模模式(L-G 句 N-G)有串聯 GDT。

備註 2＝電湧保護器安裝於受試設備後，
依照 IEC 61643-11：2011, III 類，
- 每個保護模式,使用新的試品試驗，各模式:
12kV/6kA, 2 ohm
或依照 IEC61000-4-5：2014
- 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, 12 ohm
- 浪湧次數（封各耦合路在＝應分別在 0º, 90º, 180º 句 270º 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 μF，共模 9 μF + 10 Ω。

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

Note 2＝After installed SPD in EUT,
in according to IEC 61643-11＝2011, class III,
- Using new samples each time to perfome 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 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 0º, 90º, 180º and at 270º;
- time between successive impulses: 1 min or less;
- coupling impedance: differential mode 18 μF, common mode 9 μF + 10 Ω

7 檢驗 Inspection

7.1 大氣條件 Atmospheric Conditions

溫度 Temperature: 15 ℃ -35 ℃ ，相封濕度 Relative Humidity: 45%-75%
大氣壓力 Air pressure: 86 kPa to 106 kPa，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;引線良好,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	用遊標卡尺測量引線外露長度，尺寸範圍 參照 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.
3	壓敏電壓 Varistor Voltage	1 mA 的直流電流通過壓敏電阻時測壓敏電阻兩端的電壓，需滿足在電壓範圍內。 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	漏電流 Leakage Current	在 25 ℃溫度下，施加 0.75 倍壓敏電壓時，測通過壓敏電阻的電流≤20 μA。 Measure the current passing through the varistor at 0.75Un, and at a temperature of 25 ℃, the leakage current shall be no more than 20 μA.	IEC 61051	G-II, AQL=0.25
5	介電耐壓 Dielectric Voltage	在引腳和外殼間施加工頻電壓≥2500 V，1 分鐘。 Subject the voltage no less than 2500 V, last for 1 minute between leads and enclosure.	IEC 61051	S-2, AQL=1.0
6	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
7	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
8	異常過電壓限制電流測試 Limited Current Abnormal Overvoltage Test	參見第 7 章節《檢驗》第 7.6 條 Reference 7.6 of the chapter 7 《Inspection》	UL 1449	3 PCS/Lot AC=0

7.2 機械特性 Mechanical Performances

項目 Items	試驗方法 Test methods/conditions	參考標準 Reference Standards	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 inputor 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 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 In（正、負極各 1 次）測試限制電壓，若是 回路中有 GDT 時再施加 1.2/50us 衝擊電壓 6kV/10 次(正、負極各 5 次)測試限制電壓，再施加 15 次 In 衝擊，分成 3 組，每組 5 次衝擊。每次衝擊應句電源頻率同步。從 0° 角開始，同步角 應以 30° ±5° 的間隔逐級增加。兩次衝擊之間的間隔時間方 50s~60s，兩組之間的間隔時間方 30min~35min。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種後，SPD 保持加電，或在少於 30 秒內加電到 Uc，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 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° the synchronization angle shall be increased in steps of 30° with a tolerance of ± 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 Uc. 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 Uc for another 15 min to check for stability. 30 minutes later, the SPD shall be subjected to sequences to determine the measured limiting voltagerepeatedly.

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斐化率<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%.

7.4 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 2 次 In（正、負極性各 1 次）測試限制電壓；若是回路中有 GDT 時，應依次施加峰值約方 0.1；0.2；0.5；1.0 In 的 8/20us 衝擊電流（正、負極性 各 1 次）測試限制電壓。若有 Imax 則 In 測試後再施加 2 次 Imax 衝擊（正、負極性各 1 次）測 試限制電壓， 若是回路中有 GDT 時，接著再施加 1.2/50us 衝擊電壓 6kV/10 次（正、負極各 5 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 a sequence of crest values of approximately 0,1; 0,2; 0,5; 1,0 times In shall be applied to determine the measured limiting voltage. When Imax is declared, then after In test, 2 times impulse of Imax (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;不應封人員或設備產生爆炸或其他危險;試驗後試品 In 測試時的限制電壓值小於 或等於 Up。

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 In shall be below or equal to Up .

7.5 異常過電壓限制電流測試 Limited Current Abnormal Overvoltage Test

測試方法:依 UL 1449 第四版中的圖 44.2 所示,測試電壓依 UL1449 4th 中的表 44.1 所示。將測試樣品端短路,調節可斐電阻,使測試電流分別方 0.125A,0.5A,2.5A,5A 和 10A 進行測 試,測試時間方 7 小時,直至溫度或電流達到平衡,或產品內部熱脫扣斷開電源。

Test Method: See the figure 44.2 in UL 1449 4th 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.

判定標準:測試過程中產品不允許發出火焰,紗布起火和引燃外殼; 測試後 5 分鐘內內部的熱脫扣裝置接上電源在規定電壓下測試的漏電流要求小於 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.

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8 安裝使用及維護 Installation and maintenance

8.1 EZ20D(G)277M-L 用於主線保護,句主線串聯使用。

EZ20D(G)277M-L for the main line protection, used series with the main line. EZ20D(G)277S-L 用於並聯電源使用。

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

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

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.

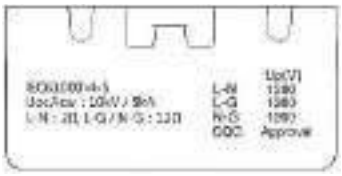
9 標示及包裝 Marks and Package

9.1 本體標示 Product Body Marking:

例如 ex:

EZ20D277M-L

正視圖 Front view



上視圖 Top view

9.2 包裝標籤 Package Marking:

(a). 產品編號 ID NO

(b). 品名規格 Part NO

(c). 品種 Model

(d). 批號 Lot NO

(e). 數量 Quantity

(f). 生產週期 Date Code

9.3 包裝 Packaging

塑料包殼 Plastic Tray (210*150*10mm) 12 PCS/Plastic Tray	
內殼 Inner Box (250*168*70mm) 12 PCS/ 盒 BOX	
外箱 Qutside Box (350*260*150mm) 48 PCS/ 箱 Carton	

以下無正文 END