

DP-7328

HIGH VOLTAGE DIFFERENTIAL PROBE

差動測試棒

Instruction Manual



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GENERAL SAFETY SUMMARY

- Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazards, use this product only as specified.
- Only qualified personnel should perform service procedures.
- Ensure that the output BNC connector is attached to the BNC input channel of the oscilloscope AND the oscilloscope is properly grounded.



Safety Precautions: to avoid fire or personal injury

Use proper power cord. Use only the power cord specified for this product and certified for the country of use.

Connect and disconnect properly. Do not connect or disconnect probes or test leads while they are connected to a voltage source.

Connect and disconnect properly. Connect the probe output to the measurement instrument before connecting the probe to the circuit under test. Connect the probe reference lead to the circuit under test before connecting the probe input. Disconnect the probe input and the probe reference lead from the circuit under test before disconnecting the probe from the measurement instrument.

Ground the product. This product is indirectly grounded through the grounding conductor of the mainframe power cord. To avoid electric shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, ensure that the product is properly grounded.

Observe all terminal ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do not apply a potential to any terminal, including the common terminal, that exceeds the maximum rating of that terminal.

Respect the max input voltages:

1. Max differential voltage: ± 1400 V (DC + AC peak) or 990 Vrms.
2. Max voltage between each input terminal and ground: 495 Vrms.

Power disconnects. The power cord disconnects the product from the power source. Do not block the power cord; it must remain accessible to the user at all times.

Do not operate without covers. Do not operate this product with covers or panels removed.

Do not operate with suspected failures. If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Avoid exposed circuitry. Do not touch exposed connections and components when power is present.

Use proper AC adapter. Use only the AC adapter specified for this product.

Do not operate in wet/damp conditions.

Do not operate in an explosive atmosphere. Keep product surfaces clean and dry.

Explanation Symbols

The following symbol(s) may appear on the product:



Attention refers to operation Instructions.



Dangerous voltage may be present at terminals.



This instrument has double insulation.

Compliance Information

This product complies with the following safety regulations:

Electrical Safety to IEC 61010-1:

- Dual Insulation
- Installation Category III
- Pollution Degree 2. (Note: Rated for indoor use only)
- Rated Voltage or Max Live-Earth: 495 Vrms



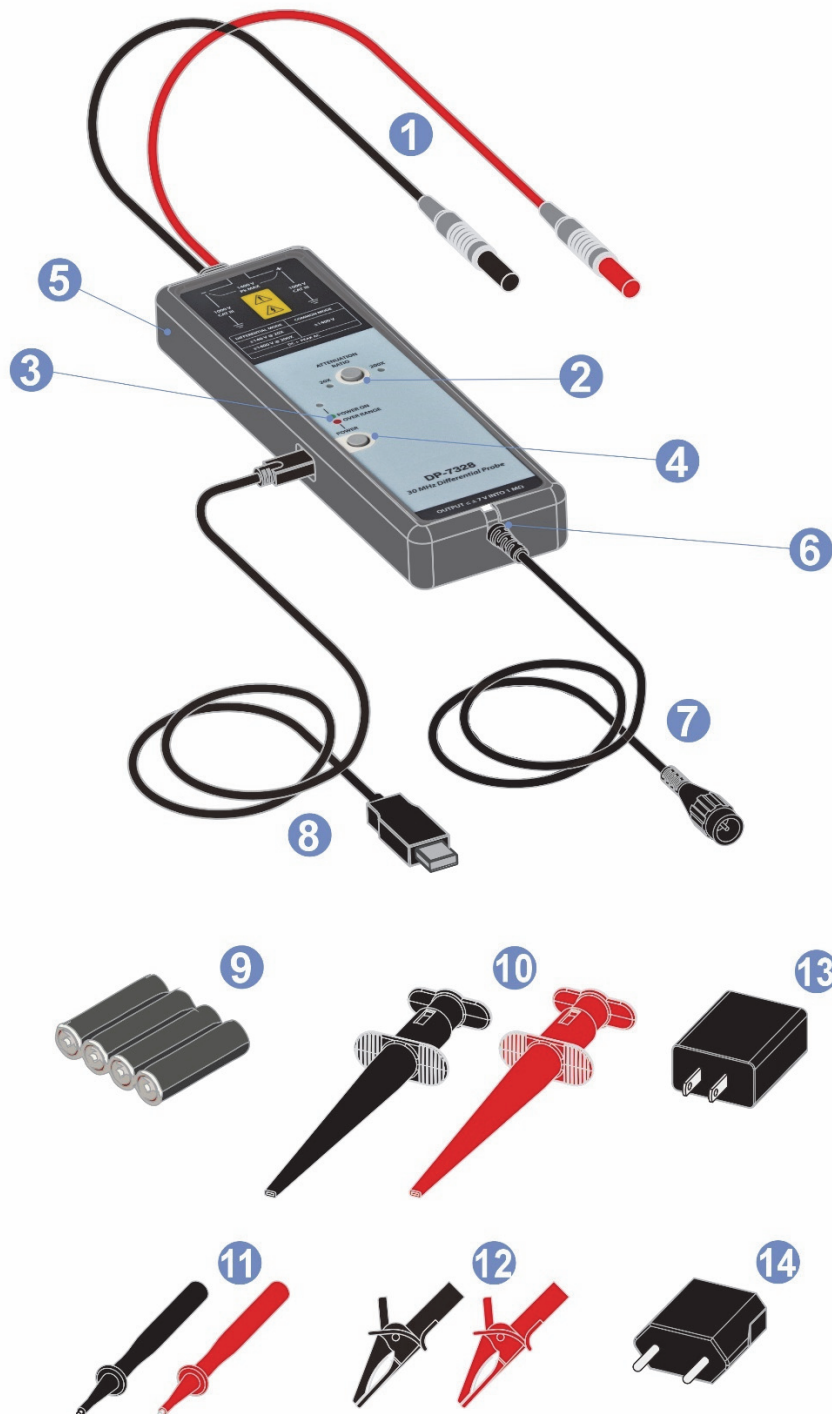
CE Mark: conforms to EN IEC 61326-1 : 2021 standards.

PRODUCT INTRODUCTION

The DP-7328 series differential probes provide a safe, isolated measurement solution for use with all types of oscilloscopes. They convert high differential input voltages ($\leq \pm 1400$ V DC + AC peak) into low-level voltages ($\leq \pm 7$ V) referenced to earth ground for waveform display on oscilloscopes. With a bandwidth of up to 30 MHz, the DP-7328 series is well suited for high-power testing and R&D applications. The probe output scaling is specified for oscilloscopes with a 1 M Ω input impedance. When a 50 Ω termination or matching adapter is used, the attenuation factor becomes exactly twice the specified value. The DP-7328 series features a high-sensitivity design with attenuation settings of X20 and X200. Both attenuation ratios are based on multiples of 20, allowing for easy voltage calculation and reducing the risk of measurement errors. The maximum input voltage reaches 2.8 KVP-p, making this series suitable for high-voltage measurement applications.



Description of the Instrument and Accessories



- | | |
|--------------------------------------|---|
| ① Integral Input Leads | ② Attenuation Selection Button & LED Indicators |
| ③ Power and Over Range Indicator | ④ Power Button |
| ⑤ Protective Rubber Boot (Removable) | ⑥ External Power Source [DC5V] |
| ⑦ Output Connector/ BNC Cable | ⑧ USB Cable (USB-520 type C) [L=100cm] |
| ⑨ AA batteries X 4 PCS | ⑩ Hook Clips (BP-256A) |
| ⑪ Test Probes (BP-286N) | ⑫ Alligator Clips (BP-276N) |
| ⑬ AC adapter (ADP-52) [100~240V] | ⑭ Plug Convertor (PLUG-220) [100~240V] |

Electrical Specifications

Function/ Model	DP-7328
Bandwidth (-3dB)	DC - to 30 MHz
Attenuation	X20 / X200
Accuracy	$\leq \pm 2\%$
Voltage Input Ranges	$\leq \pm 140$ V (DC + AC peak) for X20, (i.e about 99 Vrms) $\leq \pm 1400$ V (DC + AC peak) for X200, (i.e about 990 Vrms)
Permitted Max. Input Voltage	Max differential voltage: ± 1400 V (DC + AC peak) Max voltage between each input terminal and ground: 495 Vrms
Input Impedance	5 M Ω // 2 pF each side to ground
Output Voltage	$\leq \pm 7$ V
Output Impedance	50 Ω (for 1 M Ω input oscilloscope)
Rise Time	≈ 14 ns
Rejection Rate on Common Mode	60 Hz: > 70 dB / 20 KHz: > 60 dB / 200 KHz: > 50 dB

General Specifications

Model	DP-7328
Power Supply	External 5V/2A DC (USB Input)
Dimensions	220 x 68 x 28 mm (excluding Input leads)
Weight	488 g
Temperature	Reference: +20 °C ~ +30 °C Use: 0 °C ~ +50 °C Storage: -30 °C ~ +70 °C
Relative Humidity	Reference: ≤ 70 %RH Use: 10 % ~ 85 %RH Storage: 10 % ~ 90 %RH
Accessories	Hook clips x 2 pcs, Alligator clips x 2 pcs, Test probes x 2 pcs, USB cable x 1 pc, Plug convertor x 1 pc, AC adapter x 1 pc, AA batteries X 4 pcs, QR code card

OPERATING INFORMATION

Connecting to the Instrument

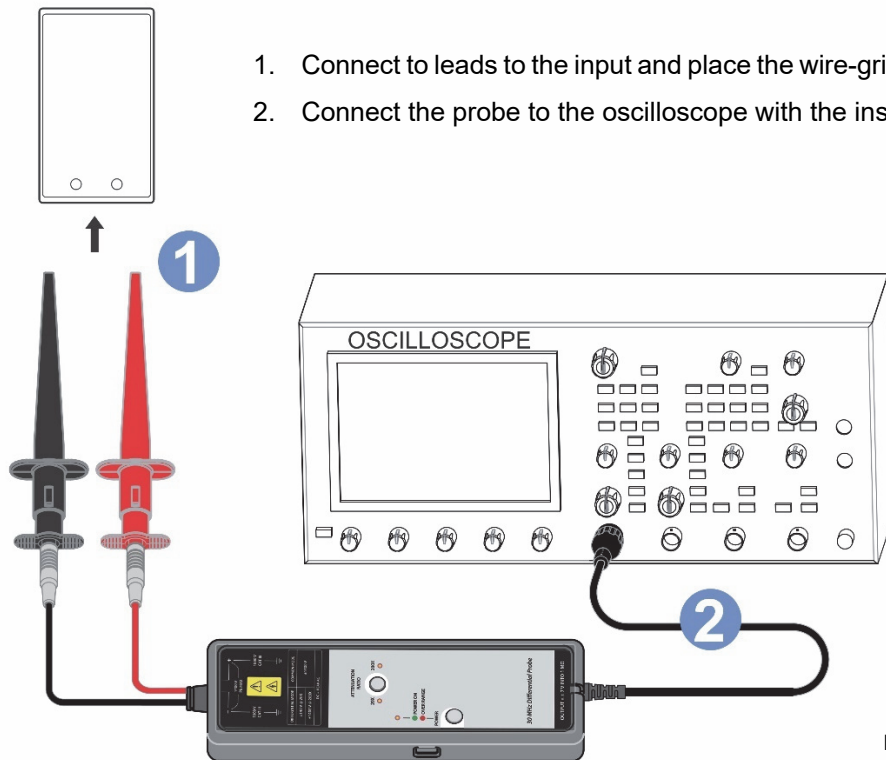


Figure1.

3. Adjust the vertical zero adjustment of the oscilloscope if necessary.
4. Select the attenuation ratio and the vertical deviation of the oscilloscope in accordance with the conversion table1.
5. NB. The POWER light must come on.

table1. The conversion table gives the real vertical deviation:

Attenuation	X200	X20
MAX Voltage Input Range (DC+AC Peak)	$\pm 1400 \text{ V}$	$\pm 140 \text{ V}$
DC MAX INPUT	$\pm 1400 \text{ V}$	$\pm 140 \text{ V}$
AC RMS MAX INPUT	990 Vrms	99 Vrms

Vertical deviation on the oscilloscope in V/div	Real Deviation In V/div	
	X200 Range	X20 Range
1	200	20
0.5	100	10
0.2	40	4
0.1	20	2
50 m	10	1
20 m	4	0.4
10 m	2	0.2
5 m	1	0.1
2 m	0.4	0.04



NOTE. The real vertical deviation in V/div is equal to the attenuation factor multiplied by the range of vertical deviation selected on the oscilloscope. It will be doubled in the case of use of a $50\ \Omega$ load.

Example:

With the probe on factor X20, the oscilloscope on 0.5 V/div,
the real vertical deviation is $20 \times 0.5 = 10\text{ V/div}$.

With a $50\ \Omega$ load on the input of the oscilloscope the deviation becomes 5 V/div

Disconnecting from the Instrument



WARNING. To avoid electrical shock, disconnect the probe inputs from the circuit before disconnecting the probe from the instrument.

1. Turn the probe connector counterclockwise.
2. Pull straight out.

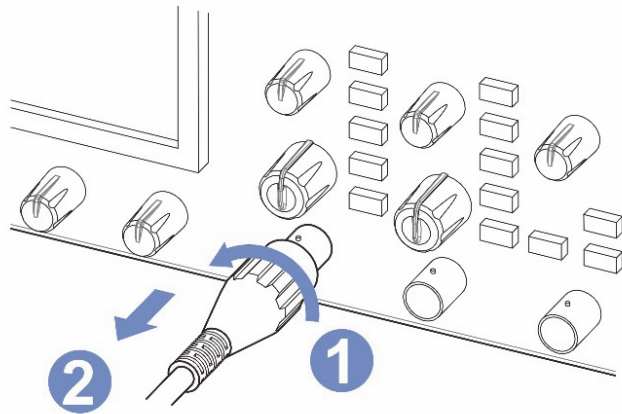


Figure2.

Twisting the input leads

Twisting the input leads helps to cancel noise from high-EMI environments that is induced into the input leads.

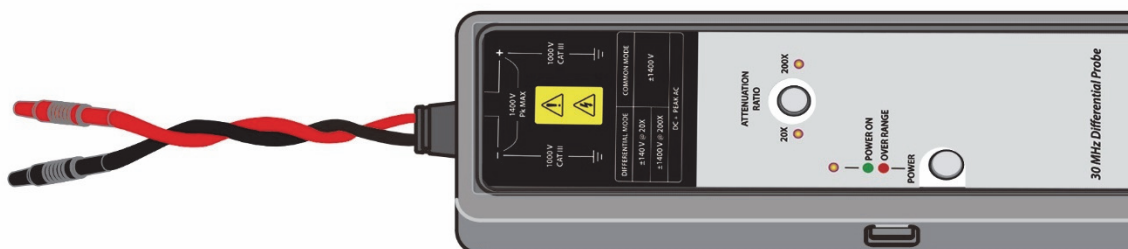
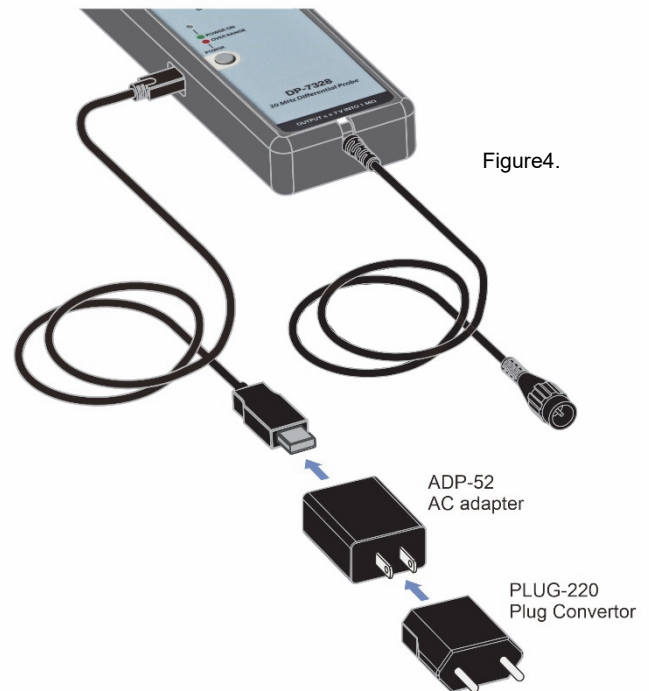


Figure3.

External Power Source

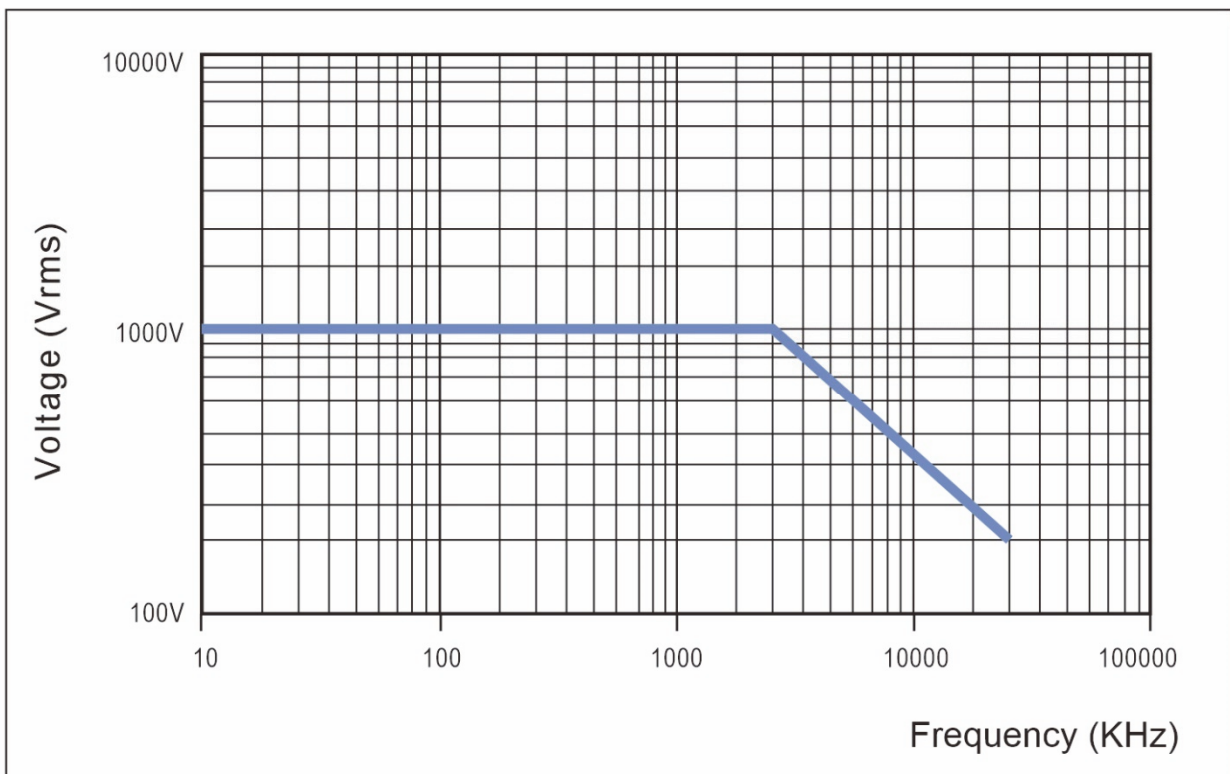
Please use the attached adapter only. (Refer Figure4.)

If there are any damage on the adaptor, please contact us and use the adaptor supply by us only. If the input power over 12 V DC will be caused to the probe hard damage.



Derating Curve

The DP-7328 derating curve of the absolute maximum input voltage in common mode is shown as below.



MAINTENANCE

For maintenance purposes, only specified spare parts shall be used. The manufacturer shall not be held responsible for any accident or damage resulting from repairs performed by persons other than the manufacturer's authorized after-sales service or approved repair centers.

Cleaning

This probe does not require any special cleaning procedures. If necessary, clean the housing with a soft cloth slightly moistened with mild soapy water. Do not use abrasive cleaners or solvents.

Warranty

Unless otherwise stated, this instrument is warranted against defects in materials and workmanship for a period of one (1) year from the date of purchase. This warranty does not apply to damage resulting from misuse, improper operation, unauthorized repair, or modification. The manufacturer's liability under this warranty is limited, at its discretion, to the repair or replacement of defective equipment and shall in no event exceed the original invoiced purchase price. All shipping costs, including transportation to and from the service center, shall be borne by the customer.

Repair

For maintenance or repairs, whether under warranty or not, please return the product to your authorized distributor.

一般安全概要

- 使用本產品前，請先查看以下安全預防措施，以避免受傷並防止損壞本產品或與其相連的設備。為避免潛在危險，請僅按規定使用本產品。
- 只有合格的人員才能執行維修程序。



安全注意事項：避免火災或人身傷害

使用合適的電源線。 僅使用為本產品指定並經使用國家/地區認證的電源線。

正確連接和斷開連接。 當測試棒或測試線連接到電壓源時，不要連接或斷開它們。

正確連接和斷開連接。 在將測試棒連接到被測電路之前，請先將測試棒輸出端連接到測量儀器。在連接測試棒輸入之前，請將測試棒引線連接到被測電路。在將測試棒與測量儀器斷開連接之前，請將測試棒輸入端和測試棒引線與被測電路斷開。

將產品接地。 本產品通過主機電源線的接地導體間接地。為避免觸電，接地導體必須接地。在連接產品的輸入或輸出端子之前，請確保產品正確接地。

遵守所有端子額定值。 為避免火災或電擊危險，請遵守產品上的所有額定值和標記。在連接到產品之前，請查閱產品手冊以獲取更多額定值信息。

請勿對任何端子（包括公共端子）施加超過該端子最大額定值的電位。

遵守最大輸入電壓：

1. 最大差動電壓： $\pm 1400\text{ V}$ （DC + AC 峰值）或 990 Vrms。
2. 輸入端與接地端之間的最大差動電壓：495 Vrms。

斷開電源。 不要阻塞或遮蓋電源線，電源線必須隨時能斷開產品與電源的連接。

不要在沒有蓋子的情況下操作。 請勿在移除蓋板或面板的情況下操作本產品。

不要在疑似故障的情況下進行操作。 如果您懷疑本產品有損壞，請讓合格的維修人員對其進行檢查。

避免電路暴露。 通電時請勿觸摸有裸露電路的連接物和組件。

使用合適的適配器。 僅使用為本產品指定的 AC 適配器。

請勿在潮濕/潮濕的環境條件下操作。

請勿在易爆炸的環境中操作。 請保持產品表面清潔乾燥。

符號說明

產品上可能會出現以下符號：



注意並參見操作說明。



接線端子上可能存在危險電壓。



本儀器具有雙重絕緣。

安規說明

本產品符合以下安全規定：

符合 IEC 61010-1 的電氣安全：

- 雙重絕緣
- 安裝類目 III
- 污染等級 2 (註: 額定僅適用於室內使用)。
- 額定電壓或最大接地電壓：495 Vrms

 CE 標誌：符合 EN IEC 61326-1:2021 標準

產品介紹

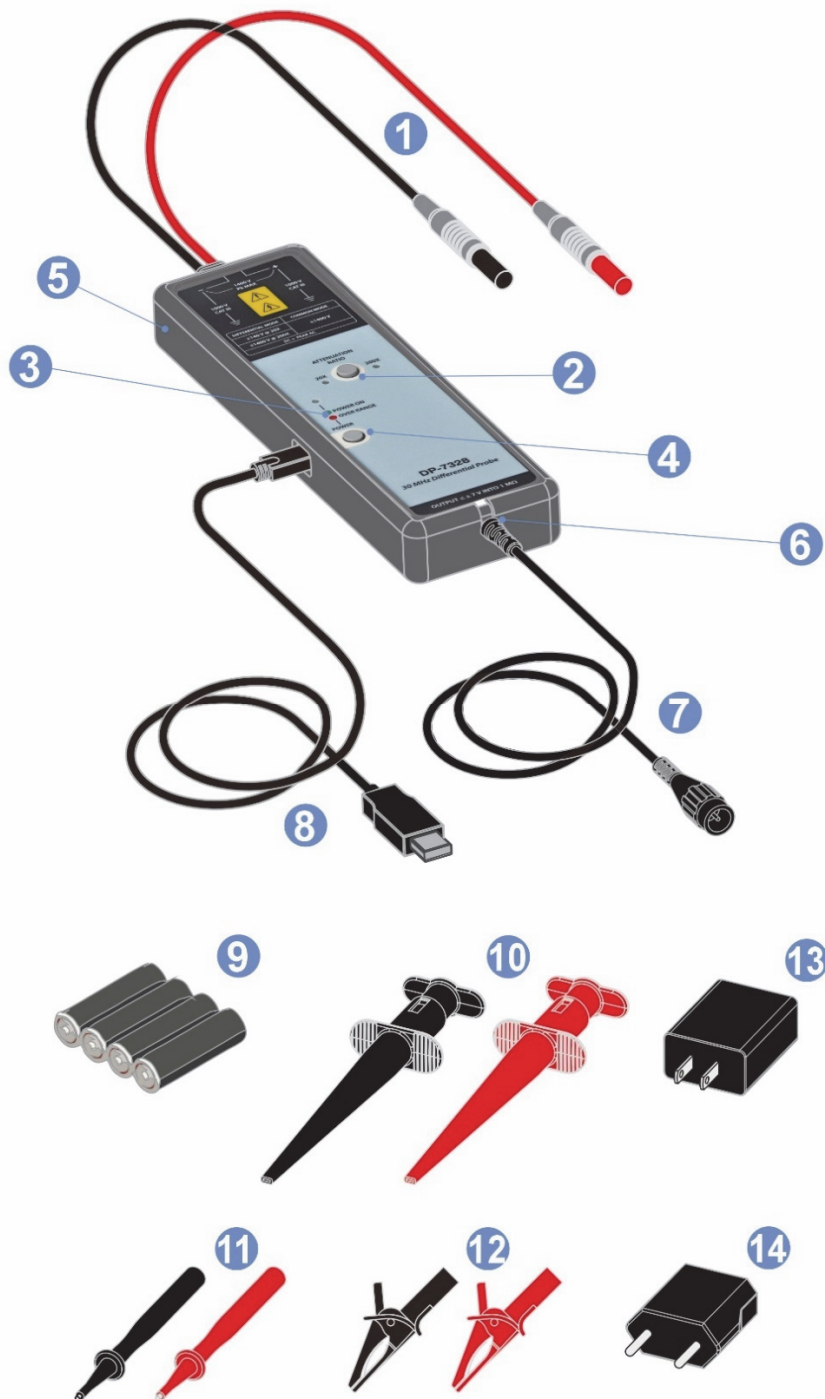
DP-7328 系列差動測試棒提供一個安全的絕緣儀器給所有的示波器使用，它可以轉換由高輸入的差動電壓 ($\leq \pm 1400$ DC+AC peak) 進入一個低電壓 ($\leq \pm 7$ V) 並且顯示波形在示波器上，使用頻率高達 30 MHz，非常適合大電力測試、研發使用。

差動測試棒輸出標示是設計在操作示波器 1 M Ω 的輸入阻抗的相對衰減量，當使用 50 Ω 匹配器時衰減量剛好為 2 倍量。

DP-7328 系列為一高靈敏度設計，衰減器 X20，X200 皆為 20 進位以方便使用者計算，且不容易出錯，其最高電壓達到 2.8 KVp-p，為一高電壓設計的機種。



儀器及附件說明



- | | |
|-------------------------|--------------------------------------|
| ① 一體式輸入引線 | ② 衰減量選擇按鈕開關和 LED 指示燈 |
| ③ 過載警示和電源 LED 指示燈 | ④ 電源開/關 |
| ⑤ 保護套 (可拆卸) | ⑥ 輸出連接器/ BNC 電纜 |
| ⑦ 外部電源輸入端 [DC5V] | ⑧ USB 傳輸線 (USB-520 type C) [L=100cm] |
| ⑨ AA 電池 X 4 PCS | ⑩ 鉤夾 (BP-256A) |
| ⑪ 測試棒 (BP-286N) | ⑫ 鱷魚夾 (BP-276N) |
| ⑬ AC 轉換器 (適配器) (ADP-52) | ⑭ 插頭轉換器 (PLUG-220) [100~240V] |

電氣規格

功能/ 型號	DP-7328
頻寬(-3 dB)	DC - to 30 MHz
衰減	X20 / X200
精確度	$\leq \pm 2\%$
輸入電壓範圍	$\leq \pm 140 \text{ V}$ (DC + AC peak) X20 檔, (約 99 Vrms) $\leq \pm 1400 \text{ V}$ (DC + AC peak) X200 檔, (約 990 Vrms)
允許最高輸入電壓	最高差動電壓: $\pm 1400 \text{ V}$ (DC + AC peak) 輸入端及接地端間最高電壓: 495 Vrms
輸入阻抗	各單端到接地端間的輸入阻抗: $5 \text{ M}\Omega // 2 \text{ pF}$
輸出電壓	$\leq \pm 7 \text{ V}$
輸出阻抗	50Ω (在 $1 \text{ M}\Omega$ 輸入阻抗的示波器系統中)
上升時間	$\approx 14 \text{ ns}$
雜訊抑制率	60 Hz: $> 70 \text{ dB}$ / 20 KHz: $> 60 \text{ dB}$ / 200 KHz: $> 50 \text{ dB}$

一般規格

型號	DP-7328
電源	指定外接 5 VDC 電源 (必須使用本公司指定品)
尺寸(不含引線)	220 x 68 x 28 mm
重量	488 g
溫度	一般狀態: $+20 \text{ }^{\circ}\text{C} \sim +30 \text{ }^{\circ}\text{C}$ 操作環境: $0 \text{ }^{\circ}\text{C} \sim +50 \text{ }^{\circ}\text{C}$ 儲存環境: $-30 \text{ }^{\circ}\text{C} \sim +70 \text{ }^{\circ}\text{C}$
相對溼度	一般狀態: $\leq 70 \% \text{RH}$ 操作環境: $10 \% \sim 85 \% \text{RH}$ 儲存環境: $10 \% \sim 90 \% \text{RH}$
標準附件	鉤夾 x 紅黑各 1, 鱷魚夾 x 紅黑各 1, AA 電池 X 4 測試棒 x 紅黑各 1, USB 連接線 x 1 條, 插頭轉換器 x 1 個, AC 轉換器(適配器) x 1 個, QR code 下載卡

操作說明

連接到儀器

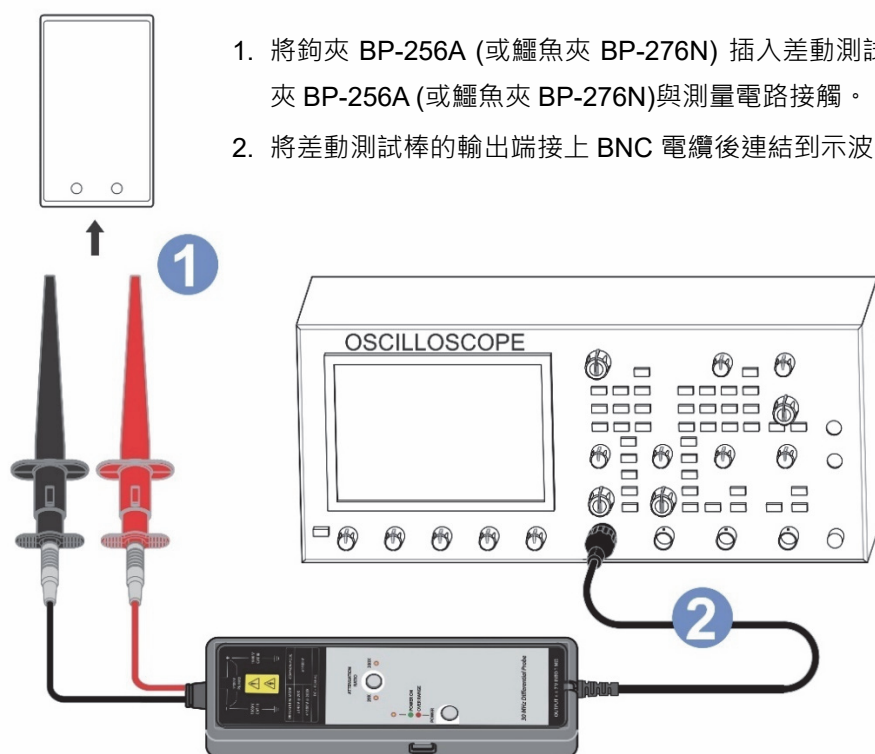


圖 1.

3. 如有需要先調整示波器上的垂直開關。
4. 將示波器上的衰減率及垂直開關調整到一致的位置，如表格 1. 所示。
5. **注意！** 電源必須打開。

表格 1. 垂直偏差換算表

衰減	X200	X20
最大輸入電壓(DC+AC Peak)	± 1400 V	± 140 V
DC 最大輸入值	± 1400 V	± 140 V
AC 最大輸入值	990 Vrms	99 Vrms
換算實際偏向 V/div		
示波器上的垂直偏向 V/div	X200 檔	X20 檔
1	200	20
0.5	100	10
0.2	40	4
0.1	20	2
50 m	10	1
20 m	4	0.4
10 m	2	0.2
5 m	1	0.1
2 m	0.4	0.04



注意! 實際的垂直偏向等於測試棒的衰減倍率乘以示波器上所選擇的垂直偏向範圍。若示波器輸入端使用 $50\ \Omega$ 負載，則該垂直偏向將變為原來的兩倍差異。

例如:

當測試棒設定在 $X20$ (20 倍) · 示波器垂直偏向設定為 $0.5\ \text{V/div}$ 時,
實際的垂直偏向為: $20 \times 0.5 = 10\ \text{V/div}$

若在示波器輸入端使用 $50\ \Omega$ 負載，則垂直偏向變為 $5\ \text{V/div}$

斷開與儀器連接



警告! 為避免電擊，在將測試棒與儀器斷開連接之前，請先將測試棒與電路斷開。

1. 逆時針轉動 BNC 接頭。
2. 直接拉出 BNC 接頭。

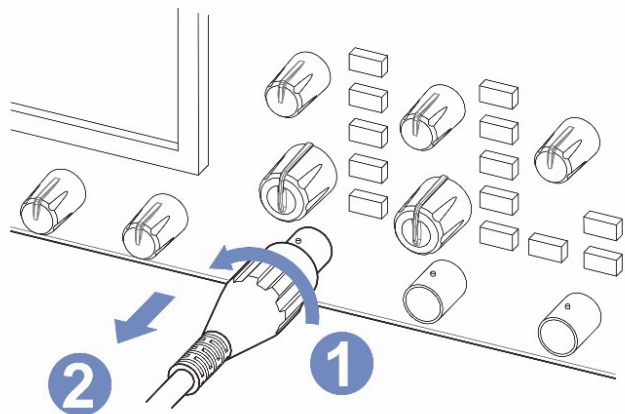


圖 2.

輸入引線絞線

量測時將輸入線絞線，可以有效避免環境電磁干擾與雜訊。

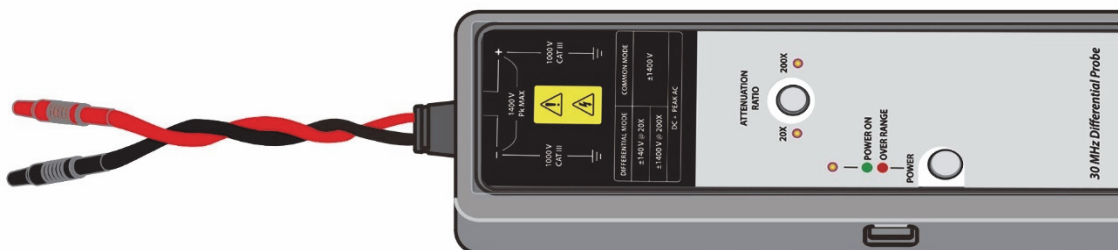


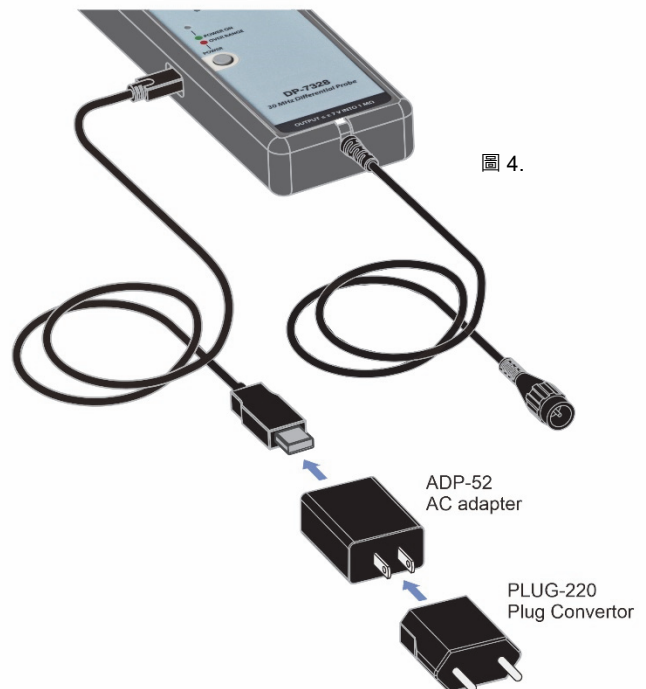
圖 3.

外部電源

請僅使用附件轉換器(適配器)連接電源。(圖 4.)

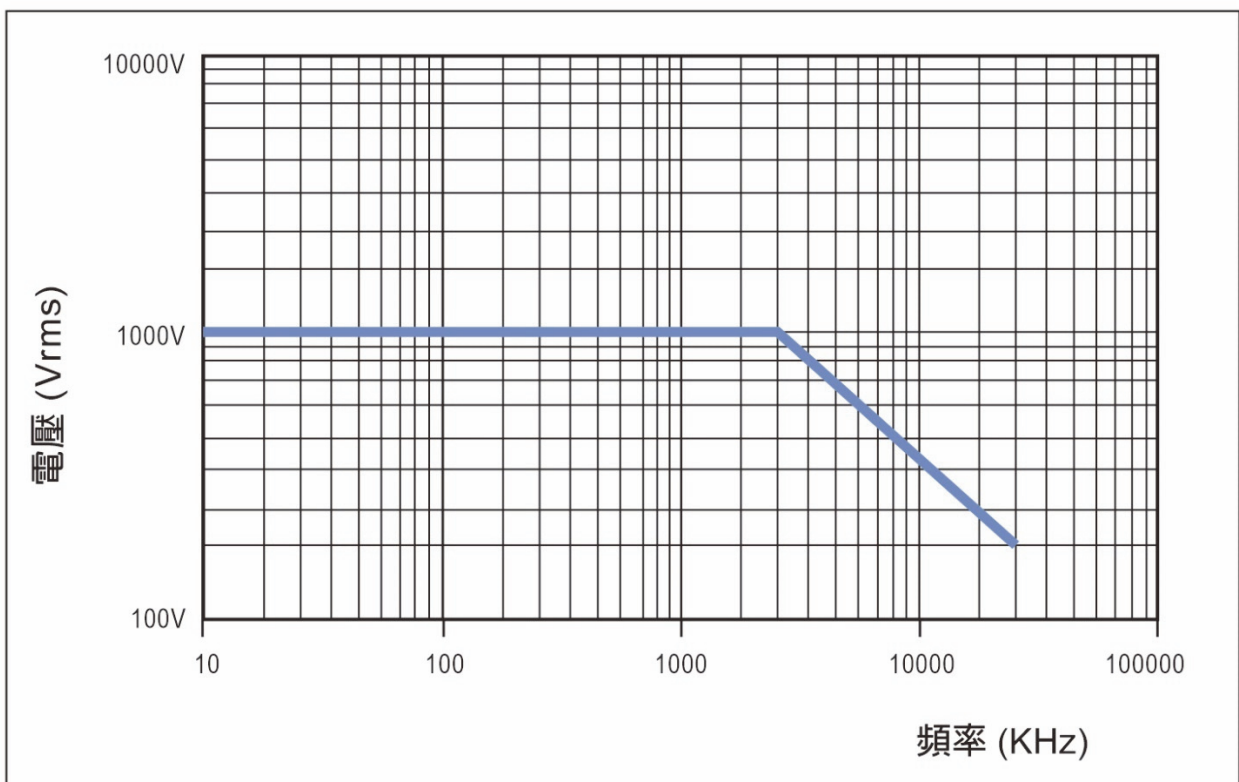
如果電源轉換器(適配器)有任何損壞，請與我們聯繫並僅使用我們提供的轉換器(適配器)。

注意! 如果輸入電源超過 12 V DC 會導致測試棒造成硬損壞。



降額曲線

DP-7328 高頻耐壓曲線是以最大共模輸入電壓為例:



產品維護

保養此產品時請使用原廠指定的工具，原廠將不負任何責任由其他不被認可的維修人員所做的維修。

清潔

此產品不需要任何特定的清潔，如有需要，請用輕軟乾淨的棉布沾上微量的清潔液輕輕的在產品外觀擦拭。

保固

除了人為的特意損壞，本產品受保固並可以回原廠維修，但並不包含在安全規範的責任。

保固是以不超出發票上的金額，零件的更換及運送的費用。

保固是僅在正常操作下所造成的損壞，並不包含任何刻意的損壞、操作上的錯誤、機械上的操作不當、保養不當、負載或過壓等問題。

原廠的保固僅包含有限的單純更換損壞的零件，使用者將不可歸據直接或間接的責任在原廠。

原廠的保固是售出後的 12 個月內，如有任意的非原廠的維修或更換零件，原廠保固將自然取消。

維修

任何維修/保養/更換零件，請一律將產品退回原廠處理。

ATTACHED/ 附圖

Standard Accessories/ 標準附件示意圖



PS. Refer to P.4 attachment description. / 請參照 P.13 附件說明。

