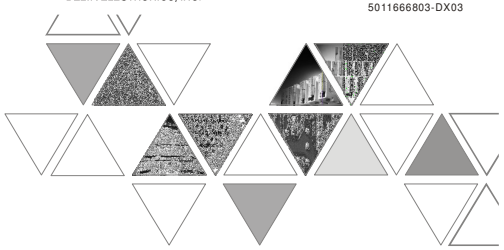
2011-07-20

5011666803-DX03

DELTA ELECTRONICS, INC.



# DVP-SX

## INSTRUCTION SHEET

**安裝說明**
**安装说明**

▲ ***Multi-Functional, Built-in Analog I/O, Multiple Instructions***
▲ 多功能 內建類比***I/O*** 豐富指令集
▲ 多功能 内建模拟***I/O*** 丰富指令集

www.delta.com.tw/industrialautomation

DVP-1030070-02

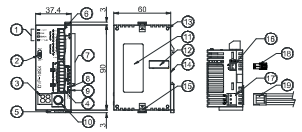
## ⚠ Warning ENGLISH

- ✓ *This Instruction Sheet only provides descriptions for electrical specifications, general specifications, installation & wiring, troubleshooting and peripherals. Other detail information about programming and commands is compatible with SA/SC/SX series; please see PLC Application Manual. For more information about the optional peripheral, please see individual product manual.*
- ✓ *This is an OPEN TYPE PLC. The PLC should be kept in an enclosure away from airborne dust, humidity, electric shock risk and vibration. Also, it is equipped with protective methods such as some special tools or keys to open the enclosure, so as to avoid the hazard to users and the damage to the PLC.*
- ✓ *Never connect the AC main circuit power supply to any of the input/output terminals, as it will damage the PLC. Check all the wiring prior to power up. To avoid any electromagnetic noise, make sure the PLC is properly grounded* ⏚. *DO NOT touch terminals when power on.*

## ❶ Introduction

Thank you for choosing DELTA's PLC DVP series. The DVP-SX series is a 10-point (4DI+2DO+2AI+2AO) special main processing unit. Besides the same commands and functions as DVP-SA/SX/SC series, 2-CH 12-bit analog voltage/current input and 2-CH 12-bit analog voltage/current output are all bipolar. There is built-in 2-digit 7-segment display corresponds to internal register directly to display PLC station or user-defined code. When an error occurs, the display will blink and show "Er" and "01" or "02" alternately (01 indicates syntax error and 02 indicates PLC program loss).

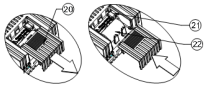
### ■ Product Profile and Outline



Units: mm

| | |
|---|---|
| 1 | Status indicator: POWER, RUN, ERROR,BAT.LOW |
| 2 | RUN/STOP switch |
| 3 | 2-digital 7-segment display |
| 4 | Digital I/O terminal |
| 5 | DIN rail clip |
| 6 | Analog I/O terminals |
| 7 | I/O point indicators |
| 8 | COM1 (RS-232) (Rx) indicator |
| 9 | COM2 (RS-485) (Tx) indicator |
| 10 | COM1 (RS-232) Communication port (Slave) |
| 11 | Nameplate |
| 12 | Expansion port |
| 13 | Mounting hold of the expansion unit |
| 14 | DIN rail (35mm) |
| 15 | Expansion unit clip |
| 16 | COM2 (RS-485) Communication port |
| 17 | DC Power input |
| 18 | 2 pin removable terminal (standard accessory) |
| 19 | Power input cable (standard accessory) |
| 20 | Battery Cover |
| 21 | Battery socket connection |
| 22 | Battery mount |

**Battery replacement:** Please change the battery within 3 minutes, or the internal data of the PLC (including the program area, RTC and latched registers) could be lost or destroyed.



## ❷ Electrical Specifications

### ■ Electrical Specifications

| Item \ Model | DVP10SX11R/T | DVP08SM11N | DVP08SN11R/T | DVP08SP11R/T | DVP16SP11R/T |
|---|---|---|---|---|---|
| Power supply voltage | MPU: 24VDC (-15% ~ 20%) (with DC input reverse polarity protection), Expansion Unit: supplied by the MPU | | | | |
| Fuse | 2A / 250VAC | - | | | |
| Power Consumption | 5W | 1W | 1.5W | 1.5W | 2W |
| Insulation Resistance | > 5 MΩ at 500 VDC (Between all inputs / outputs and earth) | | | | |
| Noise Immunity | ESD: 8KV Air Discharge<br>EFT: Power Line: 2KV, Digital I/O: 1KV, Analog & Communication I/O: 250V<br>Damped-Oscillatory Wave: Power Line: 1KV, Digital I/O: 1KV<br>RS: 26MHz~1GHz, 10V/m | | | | |
| Grounding | The diameter of grounding wire cannot be smaller than the wire diameter of terminals L and N (All DVP units should be grounded directly to the ground pole). | | | | |
| Environment | Operation: 0℃ ~ 55℃ (temperature), 50 ~ 95% (humidity), Pollution degree 2;<br>Storage: -25℃ ~ 70℃ (temperature), 5 ~ 95% (humidity); D/A output operation: 0℃ ~ 50℃ (temperature) | | | | |
| Vibration / Shock Resistance | Standard: IEC61131-2, IEC 68-2-6 (TEST Fc)/IEC61131-2 & IEC 68-2-27 (TEST Ea) | | | | |
| Weight (approx.) (g) | 138 / 133 | 64 | 88 / 68 | 90 / 70 | 96 / 76 |
| Approvals | CE cULus RCM | | | | |

| Electrical Specification of Input Point | | Electrical Specification of Output Point | | |
|---|---|---|---|---|
| Input Type | DC (SINK or SOURCE) | Output Type | Relay-R | Transistor-T |
| Input Current | 24VDC 5mA | Current Specification | 1.5A/1 point (5A/COM) | 0.3A/1 point @ 40℃; When the output of Y0 and Y1 is high-speed pulse, Y0 and Y1 = 30mA |
| Active Level | Off → On, X0,X1: above 18.5VDC X2,X3: above 16.5VDC | Voltage Specification | Below 250VAC, 30VDC | 30VDC |
| | On→Off, X0~X3 below 8VDC | Maximum Loading | 75VA (Inductive) | 9W/1 point — When the output of Y0 and Y1 is high-speed pulse, Y0 and Y1 = 0.9W (Y0 = 32kHz, Y1 = 10kHz) |
| Responding Time | About 10ms (An adjustment range of 0 ~ 20 ms could be selected through D1020 and D1021) | | 90 W (Resistive) | |
| | | Responding Time | About 10 ms | Off→On 20us<br>On→Off 30us — Y0 and Y1 are specified points for high-speed pulse |

### ■ Model Name & I/O Configuration

| Model | Power | Input | | | | Output | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Point | | Type | | Point | | Type | |
| | | DI | AI | DI | AI | DO | AO | DO | AO |
| DVP10SX11R | 24VDC +20% -15% | 4 | 2 | DC24V/5mA Sink or Source | -20 ~ 20mA range(-1,000 ~ +1,000)<br>-10 ~ +10V range(-2,000 ~ +2,000) | 2 | 2 | Relay | -20 ~ 20mA (range:-2,000 ~ +2,000)<br>-10 ~ +10V (range:-2,000 ~ +2,000) |
| DVP10SX11T | | 4 | 2 | | | 2 | 2 | Resistor | |

## ❸ Installation & Wiring

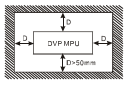
### 3.1 PLC Mounting Arrangements and Wiring Notes

**Installation of the DIN rail:**

The DVP-PLC can be secured to a cabinet by using the DIN rail that is 35mm high with a depth of 7.5mm. When mounting the PLC on the DIN rail, be sure to use the end bracket to stop any side-to-side motion of the PLC, thus to reduce the chance of the wires being pulled loose. At the bottom of the PLC is a small retaining clip. To secure the PLC to the DIN rail, place it onto the rail and gently push up the clip. To remove it, pull down the retaining clip and gently pull the PLC away from the DIN rail. As shown on the right:



When installing the DVP series PLC, make sure that it is installed in an enclosure with sufficient space (as shown below) to its surroundings so as to allow heat dissipation.




**Wiring:**




1. Please use 22-16AWG (1.5mm) wiring (either single or multiple core) for I/O wiring terminals. The specification for the terminals is as shown on the left. PLC terminal screws should be tightened to between 1.95 kg-cm (1.7 in-lbs). Use 60/75℃ copper conductor only.
2. I/O signal wires or power supply should not run through the same multi-wire cable or conduit.

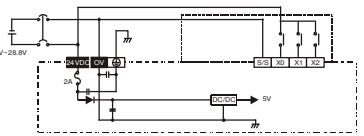
### 3.2 Wiring Notes

#### ■ Power Input Wiring

DVP-SX series input power supply is DC input. Please take a note of listed items when operating DVP-SX Series.

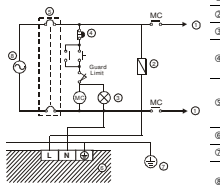
1. Please make sure the power is at terminals 24VDC and 0V (power range is 20.4VDC ~ 28.8VDC). When voltage is lower than 20.4VDC, PLC will stop operating, all outputs will turn Off and ERROR LED will flash continuously.
2. If the power-off time is less than 10ms, the PLC still operates unaffectedly. If the power-off time is too long or the power voltage drops, the PLC will stop operating and all the outputs will be Off. Once the power is restored, the PLC will return to operate automatically. (There are latched auxiliary relays and registers inside of the PLC, please be aware when programming.)

**DC Input Type**




#### ■ Safety Wiring

Since the PLC is in control of numerous devices, motion of either one device could affect the motion of other devices, therefore the breakdown of either one device would consequently be detrimental to the whole auto control system, and danger will thus be resulted. Please use the recommended wiring below for the power input:

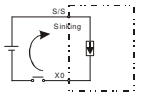


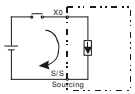

| | |
|---|---|
| ① | Power supply for AC loads |
| ② | Power Circuit Protection Fuse (3A) |
| ③ | Power On pilot indicator |
| ④ | Emergency stop<br>The machinery must provide a quick manual method disconnecting all system power. |
| ⑤ | Circuit isolation device (System Power Disconnect)<br>Utilize the electromagnetic contactor and the relay to be the isolation unit of the power circuit to prevent the possible instability of the system when the power is supplied on and off. |
| ⑥ | DVP PLC MPU (main processing unit) |
| ⑦ | Grounding |
| ⑧ | Power supply:<br>AC: 100 ~ 240VAC, 50/60Hz<br>DC: 24VDC |

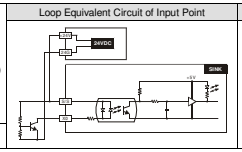
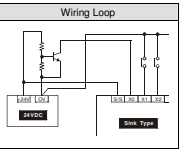
#### ■ Input Point Wiring

The input signal of the input point is the DC power DC input. There are two modes of DC type wiring: SINK and SOURCE, defined as follows:

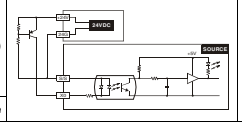
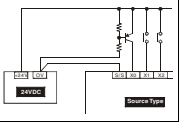
**Sink** = Current flows into the common terminal S/S **Source** = Current flows out of common terminal S/S



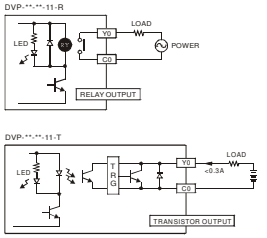

| | Loop Equivalent Circuit of Input Point | Wiring Loop |
|---|---|---|
| DC Type (DC Signal IN) |  |  |
| SINK Mode | | |



| | Loop Equivalent Circuit of Input Point | Wiring Loop |
|---|---|---|
| DC Type (DC Signal IN) |  |  |
| SOURCE Mode | | |



#### ■ Output Point Wiring



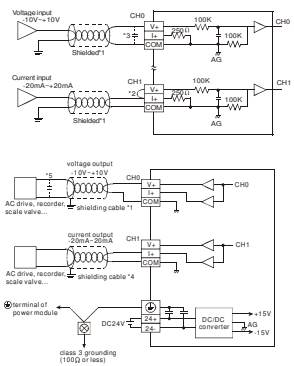

1. There are two kinds of DVP-SX Series PLC output modules: Relay and Transistor. For relevant electrical specification, please refer to the function specification.
2. Be careful with the connection of the common terminals when wiring outputs. For example, when wiring DVP12SX11R, output terminal Y0 uses one common terminal C0, Y1 uses C1, as shown below:




Action indication: When the output point is active, the corresponding indicator at the front will be on.

3. Isolated circuit: The optical coupler is used to isolate signals between PLC internal circuits and input modules.

#### ■ Analog Input/Output Point Wiring




**Note 1:**
Please isolate analog input and other power wiring.

**Note 2:**
If input signal is in current, please short out between V+ and I+ terminals.

**Note 3:**
If the noise interference from loaded input wiring terminal is significant, please connect a capacitor with 0.1 ~ 0.47μF 25V for noise filtering.

**Note 4:**
Please isolate analog output and other power wiring.

**Note 5:**
If the noise interference from loaded input wiring terminal is significant, please connect a capacitor with 0.1 ~ 0.47μF 25V for noise filtering.

**Note 6:**
Please connect ⊕ power module terminal and ⊕ analog output module terminal to system earth point and make system earth point be grounded or connects to machine cover.

***Warning:***
*DO NOT wire to the No function terminal* ●

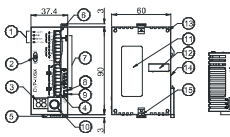
## ⚠ 注意事項 繁體中文

- ✓ 本使用 說明書 僅提供電氣規格、功能規格、安裝配線、故障排除及周邊裝置部份說明，其它詳細之程式設計及指令與 SA/SX/SC 系列相容，詳細說明請見 PLC 技術手冊【程式篇】，選購之周邊裝置詳細說明請見該產品隨機手冊。
- ✓ 本機為開放型（OPEN TYPE）機殼，因此使用 者使用 本機時，必須將之安裝於具防塵、防潮及免於電擊/衝擊意外之外殼配線箱內，另必須具備保 護措施（如：特殊之工具或鑰匙才可打開）防止非維護人員操作或意外衝擊本體，造成危險及損壞。請勿在上電時觸摸任何端子。
- ✓ 交流輸入電源不可連接於輸入/出信號端，否則可能造成嚴重損壞，請在上電之前再次確認電源配線。本體上之接地端子 ⏚ 務必正確的接地，可提高產品抗雜訊能力。

## ❶ 產品簡介

謝謝您採用台達 DVP 系列可程式控制器 - DVP-SX 機種為 10 點 4DI+2DO+2AI+2AO 特殊主機，除與 SA/SX/SC 主機具有相同的指令集及功能規格，並具有 2CH 的 12-bit 類比電壓/電流輸入及 2CH 的 12-bit 類比電壓/電流輸出，同時均具有雙極性電壓/電流輸出能力，主機並內建 2 位數的七段顯示模組，直接對應內部暫存器，可用於顯示站號或客戶自己定義的訊息代碼，不過當 PLC 有錯誤產生時會交替閃爍 Er 與數字 01 或 02（01 表示文法檢查錯誤，02 表示程序遺失）。

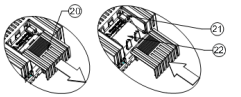
### ■ 產品外觀及各部介紹



尺寸單位：mm

| | |
|---|---|
| 1 | 電源、運行錯誤及電池低電壓指示燈 |
| 2 | RUN/STOP 開關 |
| 3 | 2 位數七段顯示模組 |
| 4 | 數位 I/O 端子 |
| 5 | DIN 軌固定扣 |
| 6 | 類比 I/O 端子 |
| 7 | 輸出/輸入指示燈 |
| 8 | COM1 (RS-232) 通訊接收(Rx)指示燈 |
| 9 | COM2 (RS-485) 通訊傳送(Tx)指示燈 |
| 10 | COM1 (RS-232) 通訊口(Slave) |
| 11 | 銘牌 |
| 12 | 擴充機連接口 |
| 13 | 擴充機定位孔 |
| 14 | DIN 軌槽 (35mm) |
| 15 | 擴充機固定扣 |
| 16 | COM2 (RS-485) 通訊口 (Master/Slave) |
| 17 | 電源輸入口 |
| 18 | 2 pin 脫落式端子（標準附件） |
| 19 | 電源輸入連接線（標準附件） |
| 20 | 電池蓋 |
| 21 | 電池插座連接 |
| 22 | 電池座 |

電池安裝：更換電池時，請在 3 分鐘內完成，否則 PLC 內部資料（包含程式區，萬年曆及停電保持暫存器）有可能會消失或被破壞。



## ❷ 產品規格

### ■ 電氣規格

| 機種 / 項目 | DVP10SX11R/T | DVP08SM11N | DVP08SN11R/T | DVP08SP11R/T | DVP16SP11R/T |
|---|---|---|---|---|---|
| 電源電壓 | 主機：24VDC（-15% ~ 20%）（具直流輸入電源相性反接保護），擴充機：由主機供應 | | | | |
| 電源保險絲 容量 | 2A/250VAC | - | | | |
| 消耗電力 | 5W | 1W | 1.5W | 1.5W | 2W |
| 絕緣阻抗 | 5MΩ 以上（所有輸出/入點對地之間 500VDC） | | | | |
| 雜訊免疫力 | ESD: 8KV Air Discharge<br>EFT: Power Line: 2KV, Digital I/O: 1KV, Analog & Communication I/O: 250V<br>Damped-Oscillatory Wave: Power Line: 1KV, Digital I/O: 1KV<br>RS: 26MHz ~ 1GHz, 10V/m | | | | |
| 接地 | 接地配線之線徑不得小於電源隔 L,N 之線徑（多台 PLC 同時使用時，請務必單點接地） | | | | |
| 操作/儲存環境 | 操作：0℃ ~ 55℃（溫度），50 ~ 95%（濕度）；污染等級 2<br>儲存：-25℃ ~ 70℃（溫度），5 ~ 95%（濕度）；D/A 輸出操作：0℃ ~ 50℃（溫度） | | | | |
| 耐振動/衝擊 | 國際標準規範 IEC61131-2, IEC68-2-6 (TEST Fc)/IEC61131-2 & IEC68-2-27 (TEST Ea) | | | | |
| 重量（約，g） | 138 / 133 | 64 | 88 / 68 | 90 / 70 | 96 / 76 |
| 認證 | CE cULus RCM | | | | |

| 輸入點電氣規格 | | 輸出點電氣規格 | | |
|---|---|---|---|---|
| 輸入形式 | 直流（SINK 或 SOURCE） | 輸出形式 | 繼電器-R | 電晶體-T |
| 輸入電流 | 24VDC 5mA | 電流規格 | 1.5A/1 點（5A/COM） | 0.3A/1 點 @ 40℃<br>高速脈波輸出時，Y0、Y1 爲 30mA |
| 動作位準 | Off → On, X0、X1 爲 18.5VDC 以上 X2、X3 爲 16.5VDC 以上 | 電壓規格 | 250VAC, 30VDC 以下 | 30VDC |
| | On → Off, X0~X3 爲 8VDC 以下 | 最大負載 | 75VA（電感性） | 9W/1 點 — 高速脈波輸出時 Y0、Y1 爲 0.9W（Y0：50kHz，Y1：10kHz） |
| 反應時間 | 約 10ms（由 D1020 及 D1021 可作 0 ~ 20ms 的調整） | | 90W（電阻性） | |
| | | 反應時間 | 約 10 ms | Off → On 20us<br>On → Off 30us — Y0、Y1 輸出爲高速脈波輸出點 |

### ■ 機種型號與 I/O 配置

| 機種 | 電源 | 輸入單元 | | | | 輸出單元 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 點數 | | 形式 | | 點數 | | 形式 | |
| | | DI | AI | DI | AI | DO | AO | DO | AO |
| DVP10SX11R | 24VDC +20% -15% | 4 | 2 | DC24V/5mA Sink 或 Source | -20 ~ 20mA (範圍：-1,000 ~ +1,000)<br>-10 ~ +10V (範圍：-2,000 ~ +2,000) | 2 | 2 | 繼電器 | -20 ~ 20mA (範圍：-2,000 ~ +2,000)<br>-10 ~ +10V (範圍：-2,000 ~ +2,000) |
| DVP10SX11T | | 4 | 2 | | | 2 | 2 | 電晶體 | |

## ❸ 安装及配線

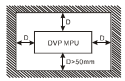
### 3.1 盤內安裝及配線

DIN 鋁軌之安裝方法：

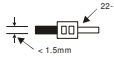
適合 35mm 之 DIN 鋁軌，主機欲掛於鋁軌時，先將 PLC 下方之固定塑膠片壓入，再將 PLC 由上方掛上再往下壓即可。欲取下 PLC 時，PLC 底部下之固定塑膠片，以起子插入凹槽，向上撐開即可，該固定機構塑膠片爲保持型，當所有的固定片撐開後，再將 PLC 往上外方取出，如右圖所示：



PLC 在安裝時，請裝配於封閉式之控制箱內，其周圍應保持一定之空間（如下圖所示），以確保 PLC 散熱功能正常。




配線：



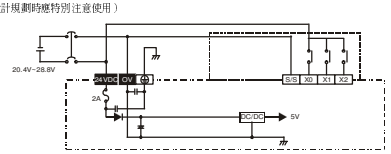

1. 輸出／入配線端請使用 22-16AWG (1.5mm)單芯裸線或多蕊線，端子規格如左所示。PLC 端子螺絲扭力爲 1.95kg-cm (1.7 in-lbs)，只能使用 60/75℃的銅導線。
2. 在配線時請勿請輸入點信號線與輸出點或電源等動力線置於同一線槽內。

### 3.2 注意事項

#### ■ 電源端輸入配線

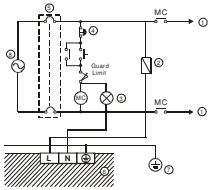
SX 機種爲直流電源輸入，在使用上應注意下列事項：

1. 電源請接於 24VDC 及 0V 兩端，電源範圍爲 20.4VDC ~ 28.8VDC，當電源電壓低於 20.4VDC 時，PLC 會停止運轉，輸出全部 Off，ERROR LED 快速閃爍。
2. 當停電時間低於 10ms 時，PLC 不受影響繼續運轉，當停電時間過長或電源電壓下降時使 PLC 停止運轉，輸出全部 Off，當電源恢復正常時，PLC 亦自動回復運轉，（PLC 內部具有停電保持的輔助繼電器及暫存器，使用者在作程式設計規劃時應特別注意使用）




#### ■ 安全配線回路

由於 PLC 控制許多裝置，任一裝置的動作可能都會影響其它裝置的動作，因此任一裝置的故障都可能會造成整個自動控制系統失控，甚至造成危險，所以在電源端輸入回路(DVPPS01/DVPPS02)，建議配置如下的保護回路：

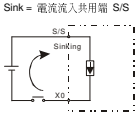



| | |
|---|---|
| ① | 交流電源負載 |
| ② | 電源回路保護用保險絲 (3A) |
| ③ | 電源指示燈 |
| ④ | 爲預防突發狀況發生，設置一緊急停止按鈕，可在狀況發生時，切斷系統電源。 |
| ⑤ | 系統回路隔離裝置<br>使用電磁接觸器，繼電器等開關作爲系統電源回路隔離裝置，可防止電源斷續供應時，造成系統的不穩定。 |
| ⑥ | DVPPS01/DVPPS02 本體 |
| ⑦ | 接地 |
| ⑧ | 電源供應：<br>交流 (AC)：100 ~ 240VAC, 50/60Hz<br>直流 (DC)：24VDC |

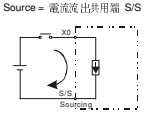
#### ■ 輸入點之配線

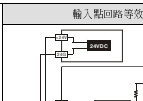
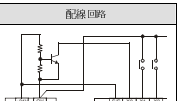
輸入點之入力信號爲直流電源 DC輸入，DC 型式共有兩種模式接法：SINK 及 SOURCE，其定義如下：

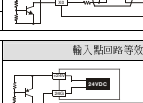
Sink = 電流流入共用端 S/S




Source = 電流流出共用端 S/S




| | 輸入點回路等效電路 | 配線回路 |
|---|---|---|
| 直流形式（DC Signal IN） |  |  |
| SINK 模式 | | |

| | 輸入點回路等效電路 | 配線回路 |
|---|---|---|
| 直流形式（DC Signal IN） |  |  |
| SOURCE 模式 | | |

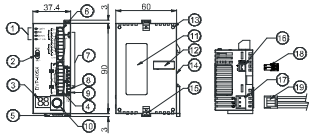
## ⚠ 注意事項 ····· 簡体中文

- ✓ 本使用說明書仅提供电气规格、功能规格、安装配线、故障排除及周边装置部份说明，其它详细之程序设计及指令与 SA/SX/SC 系列兼容，详细说明请见 PLC 技术手册【程序篇】。选购之周边装置详细说明请见该产品随机手册。
- ✓ 本机为开放型（OPEN TYPE）机壳，因此使用者使用本机时，必须将之安装于具防尘、防潮及免于电击/冲击意外之外壳配线箱内。另必须具备保护措施（如：特殊之工具或钥匙才可打开）防止非维护人员操作或意外冲击本体，造成危险及损坏，请勿在上电时触摸任何端子。
- ✓ 交流输入电源不可连接于输入/出信号端，否则可能造成严重损坏，请在上电之前再次确认电源配线，本体上之接地端子 ⏚ 务必正确的接地，可提高产品抗噪声能力。

## ❶ 产品简介

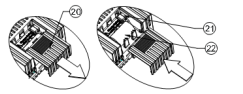
谢谢您采用台达 DVP 系列可编程序控制器。DVP-SX 机种为 10 点（4DI+2DO+2AI+2AO）特殊主机，除与 SA/SX/SC 主机具有相同的指令集及功能规格，并具有 2CH 的 12-bit 模拟电压/电流输入及 2CH 的 12-bit 模拟电压/电流输出，同时均具有双极性电压/电流输出能力，主机并内建 2 位数的七段显示模块，直接对应内部寄存器，可用于显示站号或客户自己定义的信息代码，不过当 PLC 有错误产生时会交替闪烁 Er 与数字 01 或 02（01 表示文法检查错误，02 表示程序遗失）。

#### ■ 产品外观及各部介绍



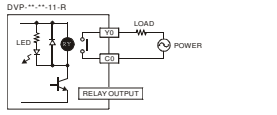

尺寸单位：mm

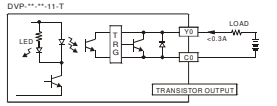
安装：更換电池时，请在 3 分钟内完成，否则 PLC 内部数据（包含程序区，万年历及停电保持寄存器）有可能会消失或被破坏。




| | |
|---|---|
| 1 | 电源、运行错误及电池低电压指示灯 |
| 2 | RUN/STOP 开关 |
| 3 | 2 位数七段显示模块 |
| 4 | 数字 I/O 端子 |
| 5 | DIN 轨固定扣 |
| 6 | 模拟 I/O 端子 |
| 7 | 输出/输入指示灯 |
| 8 | COM1 (RS-232) 通信接收 (Rx) 指示灯 |
| 9 | COM2 (RS-485) 通信传送 (Tx) 指示灯 |
| 10 | COM1 (RS-232) 通讯口 (Slave) |
| 11 | 铭牌 |
| 12 | 扩展连接口 |
| 13 | 扩展定位孔 |
| 14 | DIN 轨槽 (35mm) |
| 15 | 扩展固定扣 |
| 16 | COM2 (RS-485) 通讯口 (Slave) |
| 17 | 电源输入口 |
| 18 | 2 pin 服务式端子（标准附件） |
| 19 | 电源输入连接线（标准附件） |
| 20 | 电池盖 |
| 21 | 电池插座连接 |
| 22 | 电池座 |

#### ■ 輸出點之配線




1. DVP-S 系列 PLC 輸出模組共有二種：繼電器及電晶體，其相關電氣規格請參考功能規格部份。
2. 輸出端在實際配線時，應特別注意共享端的連接，以 DVP10SX11R 爲例，輸出端 Y0 用一個 C0 共同端，另外 Y1 用 C1，如圖所示：

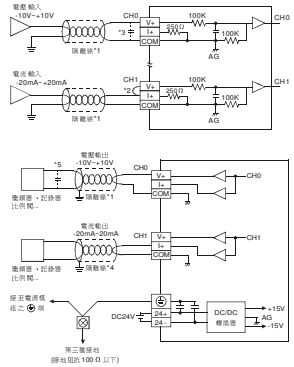



動作指示：

當輸出點動作時，正面的該點指示燈亮。

3. 隔離回路：PLC 內部回路與輸入模組之間使用光耦合器作信号隔離。

#### ■ 類比輸入／輸出點之配線




註 1：
類比輸入請與其他電源線隔離。

註 2：
如果連接電流信號時，V+ 及 I+ 端子請務必短路。

註 3：
如果輸入電壓有遭波造成配線受雜訊干擾時請連接 0.1 ~ 0.47 μF 25V 之電容。

註 4：
類比輸出請與其他電源線隔離。

註 5：
如果負載之輸出端遭波太大造成配線受雜訊干擾時，請連接 0.1 ~ 0.47μF 25V 之電容。

註 6：
請將主機之 ⏚ 端連接到系統接地點，再將系統接點作第三種接地或接到配電箱之機殼上。

注意：空端子 ● 請勿配線。

## ❷ 产品规格

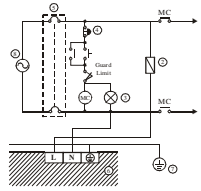
#### ■ 电气规格

| 机种 / 项目 | DVP10SX11R/T | DVP08SM11N | DVP08SN11R/T | DVP08SP11R/T | DVP16SP11R/T |
|---|---|---|---|---|---|
| 电源电压 | 主机：24VDC（-15% ~ 20%）（具直流输入电源极性反接保护），扩展：由主机供应 | | | | |
| 电源保险丝容量 | 2A / 250VAC | - | | | |
| 消耗电力 | 5W | 1W | 1.5W | 1.5W | 2W |
| 绝缘阻抗 | 5MΩ 以上（所有输出/入点对地之间 500VDC） | | | | |
| 噪声免疫力 | ESD: 8KV Air Discharge<br>EFT: Power Line: 2KV, Digital I/O: 1KV, Analog & Communication I/O: 250V<br>Damped-Oscillatory Wave: Power Line: 1KV, Digital I/O: 1KV<br>RS: 26MHz~1GHz, 10V/m | | | | |
| 接地 | 接地配线之线径不得小于电源端 L,N 之线径（多台 PLC 同时使用时，请务必单点接地） | | | | |
| 操作/储存环境 | 操作：0℃ ~ 55℃（温度），50 ~ 95%（湿度）；污染等级 2<br>储存：-25℃ ~ 70℃（温度），5 ~ 95%（湿度）；D/A 输出操作：0℃ ~ 50℃（温度） | | | | |
| 耐振动/冲击 | 国际标准规范 IEC61131-2, IEC68-2-6 (TEST Fc)/IEC61131-2 & IEC68-2-27 (TEST Ea) | | | | |
| 重 量（约, g） | 138 / 133 | 64 | 88 / 68 | 90 / 70 | 96 / 76 |
| 认证 | CE cULus | | | | |

| 输入点电气规格 | | 输出点电气规格 | | |
|---|---|---|---|---|
| 输入形式 | 直流（SINK 或 SOURCE） | 输出形式 | 继电器-R | 晶体管-T |
| 输入电流 | 24VDC 5mA | 电流规格 | 1.5A/1 點（5A/COM） | 0.3A/1 点 @ 40℃<br>高速脉冲输出时，Y0、Y1 为 30mA |
| 动作位准 | Off → On,<br>X0, X1 为 18.5VDC 以上<br>X2, X3 为 16.5VDC 以上<br>On → Off,<br>X0~X3 为 8VDC 以下 | 电压规格 | 250VAC,30VDC 以下 | 30VDC |
| | | 最大负载 | 75VA（电感性）<br>90W（电阻性） | 9W/1 点　高速脉冲输出时 Y0、Y1 为 0.9W(Y0: 50kHz，Y1：10kHz) |
| 反应时间 | 约 10ms（由 D1020 及 D1021 可作 0 ~ 20ms 的调整） | 反应时间 | 约 10 ms | Off → On 20us<br>On → Off 30us　Y0、Y1 输出为高速脉冲输出点 |

#### ■ 机种型号与 I/O 配置

| 机种 | 电源 | 输入单元 | | | | 输出单元 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 点数 | | 形式 | | 点数 | | 形式 | |
| | | DI | AI | DI | AI | DO | AO | DO | AO |
| DVP10SX11R | 24VDC +20% -15% | 4 | 2 | DC24V/5 mA Sink 或 Source | -20 ~ 20mA（范围：-1,000 ~ +1,000） | 2 | 2 | 继电器 | -20 ~ 20mA（范围：-2,000~ +2,000） |
| DVP10SX11T | | 4 | 2 | | -10 ~ +10V（范围：-2,000 ~ +2,000） | 2 | 2 | 晶体管 | -10 ~ +10V（范围：-2,000~ +2,000） |

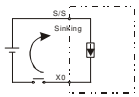



| | |
|---|---|
| ① | 交流电源负载 |
| ② | 电源回路保护用保险丝 (3A) |
| ③ | 电源指示灯 |
| ④ | 为预防突发状况发生，设置紧急停止按钮，可在状况发生时，切断系统电源。 |
| ⑤ | 系统回路隔离装置<br>使用电磁接触器、继电器等开关作为系统电源回路隔离装置，可防止电源断续供应时，造成系统的不稳定。 |
| ⑥ | DVPPS01/DVPPS02 本体 |
| ⑦ | 接地 |
| ⑧ | 电源供应：<br>交流(AC)：100 ~ 240VAC, 50/60Hz<br>直流(DC)：24VDC |

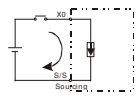
#### ■ 输入点之配线

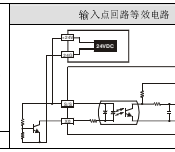
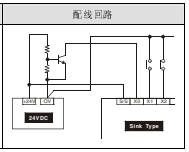
输入点之入力信号为直流电源 DC输入，DC 型式共有两种模式接法：SINK 及 SOURCE，其定义如下：

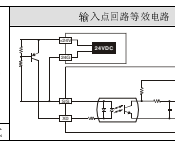
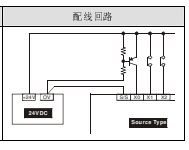
Sink = 电流流入共享端 S/S




Source = 电流流出共享端 S/S




| | 输入点回路等效电路 | 配线回路 |
|---|---|---|
| 直流形式 (DC Signal IN) |  |  |
| SINK 模式 | | |

| | 输入点回路等效电路 | 配线回路 |
|---|---|---|
| 直流形式 (DC Signal IN) |  |  |
| SOURCE 模式 | | |

## ❸ 安装及配线

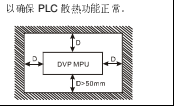
### 3.1 盘内安装及配线

DIN 铝轨之安装方法：

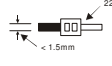
适合 35mm 之 DIN 铝轨，主机欲挂于铝轨时，先将 PLC 下方之固定塑料片压入，再将 PLC 由上方挂上再往下压即可。欲取下 PLC 时，PLC 底部下之固定塑料片，以起子插入凹槽，向上撑开即可，该固定机构塑料片为保持型，当所有的固定片撑开后，再将 PLC 往上外方取出，如右图所示：



PLC 在安装时，请装配于封闭式之控制箱内，其周围应保持一定之空间（如下图所示），以确保 PLC 散热功能正常。




配线：



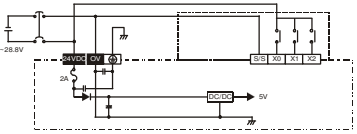

1. 输出/入配线端请使用 22-16 AWG (1.5mm) 单芯裸线或多蕊线 端子规格如左所示 PLC 端子螺丝扭力为 1.95kg-cm (1.7 in-lbs) 只能使用 60/75℃ 铜导线。
2. 在配线时请勿请输入点信号线与输出点或电源等动力线置于同一线槽内，

### 3.2 注意事项

#### ■ 电源端输入配线

SX 机种为直流电源输入，在使用上应注意下列事项：

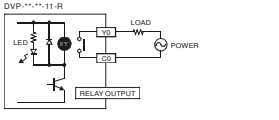
1. 电源请接于 24VDC 及 0V 两端，电源范围为 20.4VDC ~ 28.8VDC，当电源电压低于 20.4VDC 时，PLC 会停止运行，输出全部 Off，ERROR LED 快速闪烁。
2. 当停电时间低于 10ms 时，PLC 不受影响继续运转，当停电时间过长或电源电压下降将使 PLC 停止运行，输出全部 Off，当电源恢复正常时，PLC 亦自动回复运行，（PLC 内部具有停电保持的辅助继电器及寄存器，使用者在作程序设计规划时应特别注意使用）

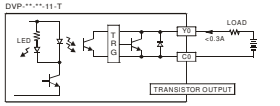



#### ■ 安全配线回路

由于 PLC 控制许多装置，任一装置的动作可能都会影响其它装置的动作，因此任一装置的故障都可能会造成整个自动控制系统失控，甚至造成危险，所以在电源端输入回路（DVPPS01/DVPPS02），建议配置如下的保护回路：

#### ■ 输出点之配线




1. DVP-S 系列 PLC 输出模块共有二种：继电器及晶体管，其相关电气规格请参考功能规格部份。
2. 输出端在实际配线时，应特别注意共享端的连接，以 DVP10SX11R 为例，输出端 Y0 用一个 C0 共同端，另外 Y1 用 C1，如图所示：

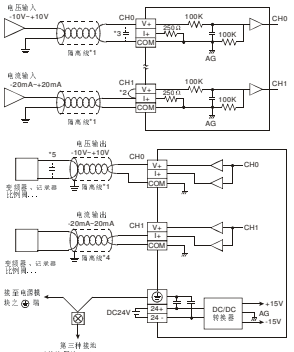



动作指示：

当输出点动作时，正面的该点指示灯亮。

3. 隔离回路：PLC 内部回路与输入模块之间使用光耦合器作信号隔离。

#### ■ 模拟输入／输出点之配线




注 1：
模拟输入请与其它 电源线隔离。

注 2：
如果连接电流信号时，V+ 及 I+ 端子请务必短路。

注 3：
如果输入电压有遭波造成配线受噪声干扰时请连接 0.1 ~ 0.47 μF 25V 之电容。

注 4：
模拟输出请与其它 电源线隔离。

注 5：
如果负载之输出端遭波太大造成配线受噪声干扰时，请连接 0.1 ~ 0.47μF 25V 之电容。

注 6：
请将主机之 ⏚ 端连接到系统接地点，再将系统接点作第三种接地或接到配电箱之机壳上。

注意：空端子 ● 请勿配线。

DELTA ELECTRONICS, INC.

# DVP-SX

## BILGI DÖKÜMANI

▲ ***Çok Fonksiyonlu, Analog giris/çikis(I/O) Çok Komutlu PLC***

http://www.delta.com.tw/industrialautomation

DVP-1030070-02

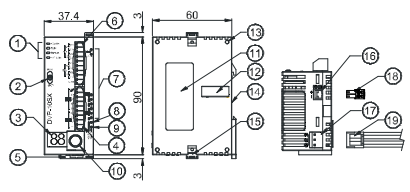
## ⚠ Uyarı ..... TÜRKÇE

- ✓ *Bu bilgi dökümanı sadece PLC'nin elektriksel özellikleri, genel özellikleri, kurulum & bağlantısı hakkında bilgiler sağlar. SA/SX/SC serisine uyumlu diğer programlama ve komutlar ile ilgili bilgiler için; PLC Application Manualine bakınız.Opsiyonel modüller ile ilgili daha fazla bilgi için, o modülün kendine ait özel bilgi dökümanına bakınız.*
- ✓ *Bu ürün AÇIK TİP PLC olduğundan dolayı toz, rutubet, elektrik şoku ve titreşimden uzak yerlere kurulumu yapılmalıdır. Tehlikeleri ve ürünün zarar görmesini engellemek için koruyucu önlemler alınmalıdır. (Ör: Panoya kilit konulması gibi).*
- ✓ *Ürünün giriş/çıkış terminallerine AC power bağlamayınız. Enerji vermeden önce tüm bağlantıların doğru yapıldığını kontrol ediniz. Elektromanyetik gürültüyü önlemek için PLC'nin düzgün topraklandığını kontrol ediniz. Enerji varken ürünün terminallerine dokunmayınız.*

## ❶ Önsöz

DELTA'nın DVP serisi PLC'lerini seçtiğiniz için teşekkürler. DVP-SX serisi PLC'lerin üzerinde 10 nokta (4DI+2DO+2AI+2AO) olan özel bir MPU vardır. DVP-SA/SX/SC serisi PLC'lerin tüm komutlarını ve fonksiyonlarını destekler. Üzerinde bipolar 2 kanal 12-bit analog voltaj/akım girişi ile 2 kanal 12-bit voltaj/akım çıkışı vardır. Ayrıca üzerinde dahili kullanıcının tanımladığı (PLC istasyon numarası, data değeri..vb) bilgiyi göstermek için 2-digit 7-segment display bulunur. Hata olduğu zaman, display flash yapacak ve sıra ile "Er" ve ardından "01" veya "02" gösterecek (01 program yazım hatasını ve 02 PLC program kaybı olduğunu gösterir).

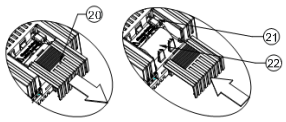
### ■ Ürün Profili ve Taslağı




Birim: mm

| | |
|---|---|
| 1 | Durum indikatör: POWER, RUN, ERROR, BAT.LOW |
| 2 | RUN/STOP anahtarı |
| 3 | 2-dijital 7-segment display |
| 4 | Dijital I/O terminal |
| 5 | DIN ray klip |
| 6 | Analog I/O terminaller |
| 7 | I/O nokta indikatörleri |
| 8 | COM1 (RS-232) (Rx) indikatör |
| 9 | COM2 (RS-485) (Tx) indikatör |
| 10 | COM1 (RS-232) Haberleşme portu (Slave) |
| 11 | Etiket |
| 12 | İlave port |
| 13 | İlave ünite montaj deliği |
| 14 | DIN ray (35mm) |
| 15 | İlave ünite montaj klip |
| 16 | COM2 (RS-485) Haberleşme portu |
| 17 | DC Power girişi |
| 18 | 2 pin sökülebilir terminal (standart aksesuar) |
| 19 | Power giriş kablosu (standart aksesuar) |
| 20 | Pil kapağı |
| 21 | Pil bağlantı soketi |
| 22 | Pil montaj yuvası |

**Pil değişimi:** Pil değişimi 3 dakika içinde tamamlanmalıdır, aksi halde PLC'nin dahili dataları (program, RTC ve kalıcı registerler) silinebilir veya zarar görebilir.




## ❷ Elektriksel Özellikler

### ■ Elektriksel Özellikler

| Model / Madde | DVP10SX11R/T | DVP08SM11N | DVP08SN11R/T | DVP08SP11R/T | DVP16SP11R/T |
|---|---|---|---|---|---|
| Power supply voltajı | MPU: 24VDC (-15% ~ 20%) (DC giriş ters bağlantı koruması), İlave Ünite: MPU'dan beslenir | | | | |
| Sigorta | 2A / 250VAC | - | | | |
| Güç Tüketimi | 5W | 1W | 1.5W | 1.5W | 2W |
| İzolasyon Direnci | > 5 MΩ at 500 VDC (tüm girişler / çıkışlar ve toprak arasında) | | | | |
| Gürültü Bağışıklığı | ESD: 8KV Air Discharge<br>EFT: Power Line: 2KV, Digital I/O: 1KV, Analog & Communication I/O: 250V<br>Damped-Oscillatory Wave: Power Line: 1KV, Digital I/O: 1KV<br>RS: 26MHz~1GHz, 10V/m | | | | |
| Topraklama | Topraklama kablosu kesiti besleme kablosu kesitinden küçük olmamalıdır. (Tüm DVP ürünleri doğrudan ground ucundan topraklanmalıdır). | | | | |
| Çalışma Ortamı | Çalışma: 0℃ ~ 55℃ (sıcaklık), 50 ~ 95% (rutubet), Kirlenme derecesi 2;<br>Saklama: -25℃ ~ 70℃ (sıcaklık), 5 ~ 95% (rutubet); D/A çıkış çalışma: 0℃ ~ 50℃ (sıcaklık) | | | | |
| Titreşim/Şok direnci | Standard: IEC61131-2, IEC 68-2-6 (TEST Fc)/IEC61131-2 & IEC 68-2-27 (TEST Ea) | | | | |
| Ağırlık (yaklaşık) gr | 138 / 133 | 64 | 88 / 68 | 90 / 70 | 96 / 76 |
| Sertefikalar | CE cULus RCM | | | | |

| Giriş Noktası Elektriksel Özellikleri | | Çıkış Noktası Elektriksel Özellikleri | | | |
|---|---|---|---|---|---|
| Giriş tipi | DC (SINK veya SOURCE) | Çıkış tipi | Röle-R | Transistör-T | |
| Giriş akımı | 24VDC 5mA | Akım özellikleri | 1.5A/1 nokta (5A/COM) | 40℃'de 0.3A/1 nokta; Y0 ve Y1 yüksek-hızlı pulse olduğunda, Y0 ve Y1 = 30mA | |
| Aktif seviyesi | Off → On, X0,X1: 18.5VDC üzeri X2,X3: 16.5VDC üzeri | Voltaj özellikleri | 250VAC altı, 30VDC | 30VDC | |
| | On→Off, X0~X3 8VDC altı | Maksimum yükleme | 75VA (endüktif) | 9W/1 nokta | Y0 ve Y1 yüksek-hızlı pulse olduğunda, Y0 ve Y1 = 0.9W (Y0 = 32kHz, Y1 = 10kHz) |
| Cevap zamanı | Yaklaşık 10ms (D1020 ve D1021 datalarından 0 ~ 20ms arası ayarlanabilir) | | 90 W (resistif) | | |
| | | Cevap zamanı | Yaklaşık 10ms | Off→On 20us<br>On→Off 30us | Y0 ve Y1 yüksek-hızlı pulse olarak belirlenmiştir |

### ■ Model Adı & I/O Konfigurasyon

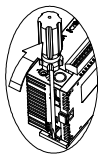
| Model | Power | Giriş | | | | Çıkış | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Nokta | | Tip | | Nokta | | Tip | |
| | | DI | AI | DI | AI | DO | AO | DO | AO |
| DVP10SX11R | 24VDC +20% -15% | 4 | 2 | DC24V/5mA Sink veya Source | -20 ~ 20mA aralık(-1,000 ~ +1,000) | 2 | 2 | Röle | -20 ~ 20mA (aralık:-2,000 ~ +2,000) |
| DVP10SX11T | | 4 | 2 | | -10 ~ +10V aralık (-2,000 ~ +2,000) | 2 | 2 | Transistor | -10 ~ +10V (aralık:-2,000 ~ +2,000) |

## ❸ Kurulum & Bağlantı

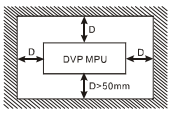
### 3.1 PLC Montaj Düzeni ve Bağlantı Notları

**DIN rayına kurulumu:**

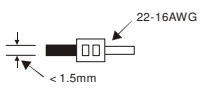
DVP-PLC üniteleri 35 mm yükseklikte ve 7.5 mm derinlikteki DIN rayı kullanılarak sabitlenebilir. PLC'yi DIN rayına monte ederken, PLC'nin ray üzerinde hareketini engelleyecek bilezikleri takmayı unutmayınız. Bu sayede PLC terminallerine bağlı kabloların kopma ve yerinden çıkma ihtimali az olur. PLC'yi DIN rayına sabitlemek için altında bulunan sabitleyici klipleri bastırınız. PLC'yi yerinden çıkartmak için sağdaki şekilde görüldüğü gibi önce alttaki sabitleyici klipi açınız ve sonra PLC'yi çekerek DIN rayından çıkarınız:



DVP serisi PLC'lerin kurulumunu yaparken, sıcaklık dağılımının sağlanabilmesi için PLC'nin çevresinde aşağıdaki şekilde gösterilen minimum boşluğun bırakıldığına emin olunuz.




**Bağlantı:**




1. I/O terminal bağlantısı için lütfen 22-16AWG (1.5mm) kablo kullanınız. (tek damarlı veya çok damarlı). Terminallerin açıklaması soldaki şekilde gösterildiği gibidir. PLC terminal vidaları 1.95 kg-cm (1.7 in-lbs) oranında sıkılmalıdır. Sadece 60/75℃ bakır iletken kullanınız.
2. I/O sinyal kabloları ile güç kaynağı kabloları aynı kablo bloğunun içinde olmamalıdır.

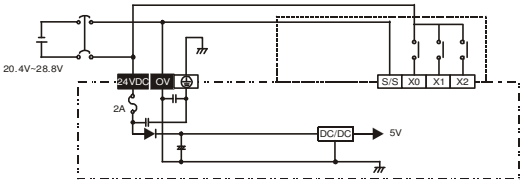
### 3.2 Bağlantı Notları

### ■ Power Giriş Bağlantısı

DVP-SX serisi ürünler DC voltaj ile beslenir. DVP-SA serisini çalıştırırken lütfen aşağıdaki notlara dikkat ediniz.

1. Lütfen 24VDC ve 0V terminallerine doğru power bağladığınıza emin olunuz. (20.4 ~ 28.8VDC arası). Eğer voltaj 20.4VDC'den küçükse, PLC çalışması duracak, tüm çıkışlar Off olacak ve ERROR LED sürekli flash yapacak.
2. Eğer ürünün beslemesi 10ms'den az bir süre kesilirse PLC etkilenmeden normal çalışmasına devam eder. Fakat enerji daha uzun süre kesilirse veya besleme voltajı düşerse, PLC çalışması durur ve tüm çıkışlar OFF olur. PLC'ye tekrar enerji verildiği zaman otomatik olarak normal çalışmasına geri döner. (PLC'nin içinde kalıcı röleler ve registerler bulunmaktadır. Lütfen programlama yaparken bunların kullanımına dikkat ediniz).

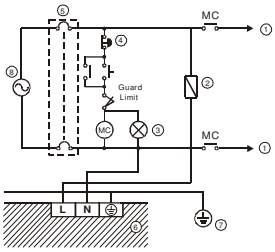
**DC Giriş Tipi**




### ■ Güvenli Bağlantı

PLC birçok donanımı kontrol edeceği için, bu donanımların herhangi bir tanesinin hareketi diğer donanımların da çalışmasını etkiler. Bu donanımlardan herhangi bir tanesinin arızalanması veya yanlış çalışması tüm

otomatik kontrol sisteminin aksamasına ve tehlikeli durumlara sebep olabilir. Power girişi için tavsiye edilen bağlantı aşağıda gösterilmiştir:

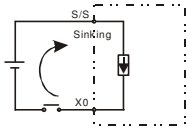



| | |
|---|---|
| ① | AC yükler için besleme |
| ② | Power Devresi Koruma Sigortası (3A) |
| ③ | Power On pilot indikatör |
| ④ | Acil stop<br>Makina sistemi manual olarak tüm sistemin enerjisini kesebilmeyi sağlamalıdır. |
| ⑤ | Sistem devresi izolasyon ünitesi (Sistem Power Kesilmesi)<br>Sistemin enerjisi aniden kesilip geldiğinde olası kararsızlığı önlemek için güç devresinde elektromanyetik kontaktör ve röle kullanılarak izolasyon birimi oluşturulur. |
| ⑥ | DVP PLC MPU (ana işlemci ünitesi) |
| ⑦ | Topraklama |
| ⑧ | Power supply:<br>AC: 100 ~ 240VAC, 50/60Hz<br>DC: 24VDC |

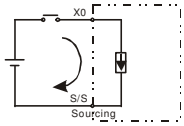
## ■ Giriş Bağlantısı

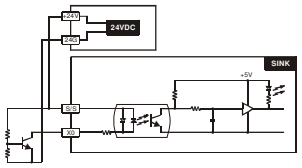
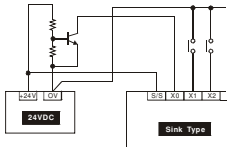
DC giriş sinyali için DC power kullanılır. İki çeşit DC bağlantı kullanılır: SINK ve SOURCE, bağlantılar aşağıda gösterildiği gibidir:

**Sink** = S/S ortak terminaline (+) bağlanır

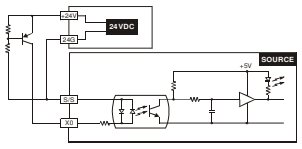
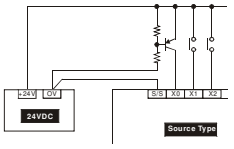



**Source** = S/S ortak terminaline (-) bağlanır




| | Giriş Bağlantısı Eşdeğer Devresi | Bağlantı |
|---|---|---|
| DC Tip (DC Signal IN)<br>SINK Mod |  |  |

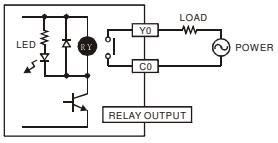


| | Giriş Bağlantısı Eşdeğer Devresi | Bağlantı |
|---|---|---|
| DC Tip (DC Signal IN)<br>SOURCE Mod |  |  |

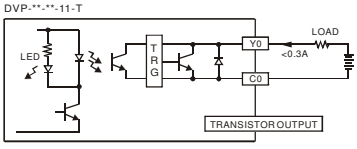


## ■ Çıkış Bağlantısı

DVP-**-**-11-R




DVP-**-**-11-T



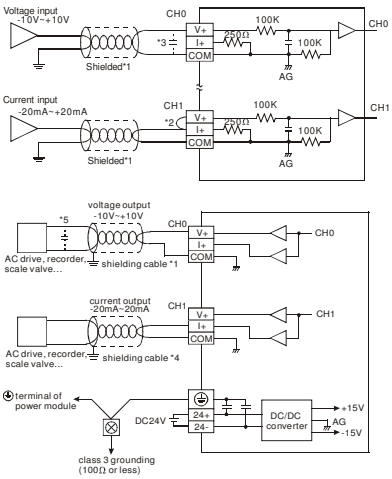

1. DVP-SX Serisi PLC'de iki tip çıkış modülü vardır: Röle veya Transistor. Elektriksel özellikler için, lütfen fonksiyon özellikleri kısmına bakınız.
2. Lütfen çıkış bağlantılarını yaparken ortak terminallerin kullanımına dikkat ediniz. Örneğin DVP10SX11R PLC'nin Y0 çıkış terminali bağlantısı için C0 ortak terminali Y1 bağlantısı için C1 ortak terminali kullanılır. Lütfen aşağıdaki şekli inceleyiniz:




Çıkış indikatörü: Çıkışlardan herhangi biri aktif olduğu zaman, ön panelde ilgili indikatör ON olur.

3. İzolasyon devresi: PLC iç devreleri ve giriş modülleri arasında sinyalleri izole etmek için optokuplör kullanılır.

## ■ Analog Giriş/Çıkış Bağlantısı




**Not 1:**

Lütfen analog giriş ve diğer power bağlantılarını izole ediniz.

**Not 2:**

Eğer akım giriş kullanılacaksa, lütfen V+ ve I+ terminallerini kısa devre ediniz.

**Not 3:**

Eğer giriş bağlantı terminallerinde gürültü oluşuyorsa, gürültüyü filtre etmek için 0.1~0.47μF 25V kapasitör kullanınız.

**Not 4:**

Lütfen analog çıkış ve diğer power bağlantılarını izole ediniz.

**Not 5:**

Eğer giriş bağlantı terminallerinde gürültü oluşuyorsa, gürültüyü filtre etmek için 0.1~0.47μF 25V kapasitör kullanınız.

**Not 6:**

Power modülü toprak ⏚ terminali ile analog çıkış modülü toprak ⏚ terminalini sistem toprağına bağlayınız, sistem toprağı ise topraklanmalı veya makine gövdesine bağlanmalıdır.

***Uyarı:***

- *işaretli terminale bağlantı yapmayınız*