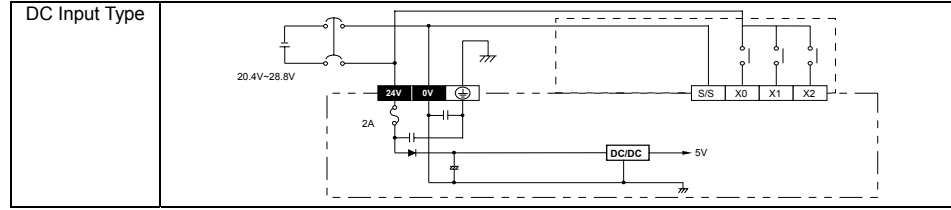


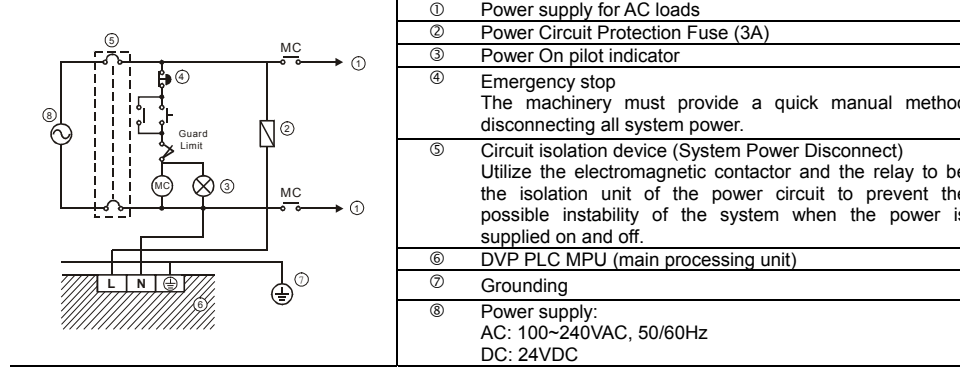


**7 TRIAL RUN**

- 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.
- Please use wires of 1.6mm or above for the grounding of the MPU.
- If the power-cut time is less than 10ms, the PLC still operates unaffectedly. If the power-cut 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.)

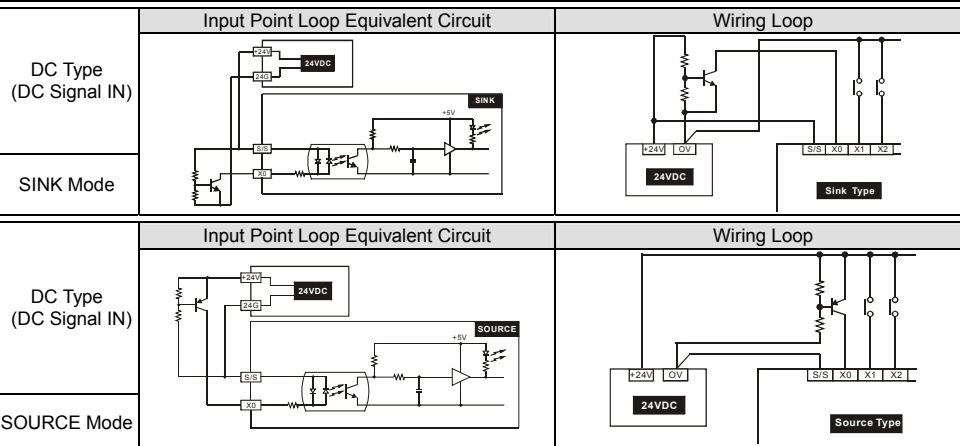
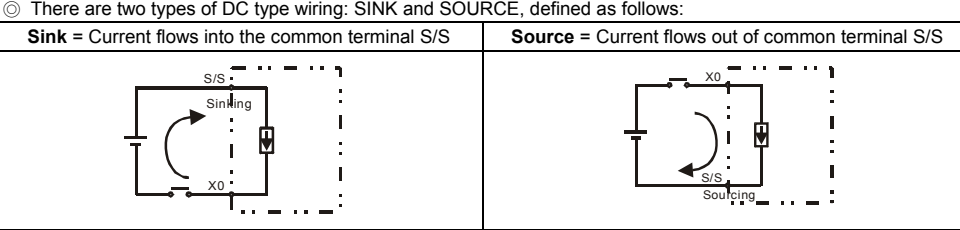


**☑ Safety Wiring**  
 Since the PLC is in control of numerous devices, motion of either one device could affect the motion of other devices, therefore the breakdown of either one device would consequently be detrimental to the whole auto control system, and danger will thus be resulted. Please use the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

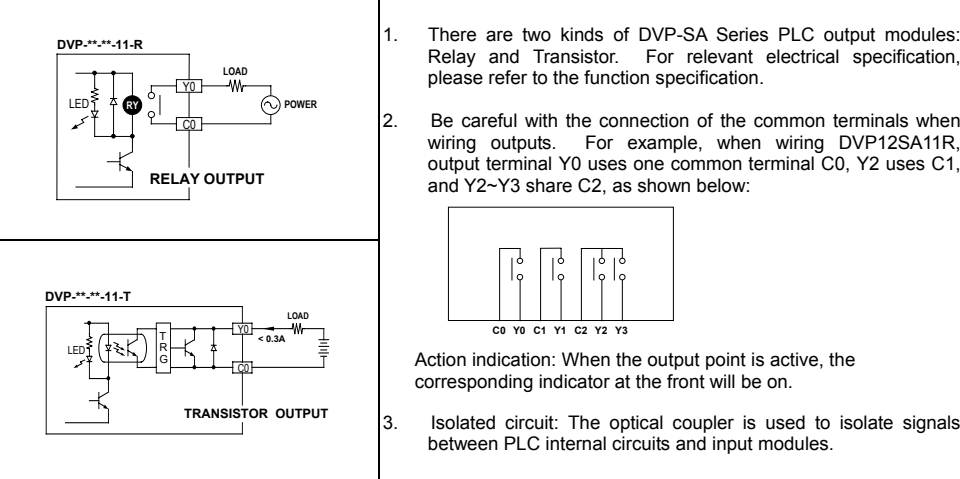


- ① Power supply for AC loads
- ② Power Circuit Protection Fuse (3A)
- ③ Power On pilot indicator
- ④ Emergency stop  
The machinery must provide a quick manual method disconnecting all system power.
- ⑤ Circuit isolation device (System Power Disconnect)  
Utilize the electromagnetic contactor and the 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:  
AC: 100~240VAC, 50/60Hz  
DC: 24VDC

**☑ Input Point Wiring**  
 The input signal of the input point is the DC power DC input. There are two types of DC type wiring: SINK and SOURCE, defined as follows:



**☑ Output Point Wiring**



**☉ Power Indication**

The "POWER" LED at the front of the MPU or the Expansion Units will be lit (in green) if the power is on. If the indicator is not on when the MPU is powered up, it means that the 24V DC power supply of the PLC is overloaded. It is thus necessary to remove the wiring on terminals +24V and 24G, and to use a 24VDC power supply instead. If the ERROR LED is blinking swiftly, it suggests that the +24V power supply of the PLC is insufficient.

**☉ Low Voltage Indication**

The "LOW V." LED on the Expansion Unit is an indication that the input power voltage is insufficient, thus all outputs of the expansion unit should be turned off.

**☉ Low Battery Voltage Indication**

There is also a "BAT.LOW" LED at the front of the MPU. When the LED is on, it indicates that the battery voltage is insufficient. Please change the batter (within 3 minutes) as soon as possible; otherwise the user programs and the data in latched area may be lost.

**☉ Preparation**

- Prior to applying power, please verify that the power lines and the input/output wiring are correct. And be advised not to supply AC110V or AC220V into the I/O terminals, or it might short-circuit the wiring and would cause direct damage to the PLC.
- After using the peripheral devices to write the program into the MPU and that the ERROR LED of the MPU is not on, it means that the program in use is legitimate, and it is now waiting for the user to give the RUN command.
- Use HPP to execute the forced On/Off test of the output contact.

**☉ Operation & Test**

If the "ERROR" LED of the MPU is not blinking, use RUN/STOP switch or the peripheral devices (HPP or WPLSoft) to give the RUN command, and the RUN indicator will then be on. If the "RUN" LED is not on, it indicates that there is no program inside the PLC.

HPP could be utilized to monitor the settings and the registered values of the timer (T), the counter (C) and the data register (D) during operation, and moreover, to force the output contacts to conduct the On/Off action. If the ERROR LED is on (but not blinking), it means that the setting of the user's program has exceeded the preset overtime limit, thus users have to double check the program and perform the On/Off function again. (The PLC is at this moment back to STOP automatically)

**☉ PLC Input/Output Reaction Time**

The total reaction time from the input signal to the output operation is calculated as follows:  
 Reaction Time = input delay time + program scan time + output delay time

Input delay time	10ms (factory default), 0~15ms adjustable. Please refer to the usage of special registers D1020~1021.
Program scan time	Please refer to the usage of special register D1010.
Output delay time	Relay module: 10ms. Transistor module: 20~30us.

**☉ Basic Commands and Application Commands of the PLC:**

- ☉ The basic commands and the application commands of the MPU of this series are totally applicable to the DELTA DVP-PLC EP Series MPU. Refer to the DELTA PLC Technique Application Manual for relevant basic commands and application commands.
- ☉ The DVPHPP handheld programming panel and the WPLSoft (the Windows version) editing program of the ladder diagram are both good for use with the DELTA DVP-PLC. Also, the PLC could connect with the DVP12SA MPU through specific transmission wire to execute the program transmission, the MPU control and the program monitoring.

**8 EXPANSION UNIT INFORMATION**

DVP-SA series provides the expansion units with different I/O points to extend input point X and output point Y.

**☉ Digital I/O Expansion unit**

Model	Power	Input / Output				Profile reference
		Point	Type	Point	Type	
DVP08SM11N	24VDC	8	DC Sink or Source	0	None	
DVP08SN11R		0		8	Relay	
DVP08SN11T		0		8	Transistor	
DVP08SP11R		4		4	Relay	
DVP16SP11R		8		8	Transistor	
DVP08SP11T		4		4		
DVP16SP11T		8		8		

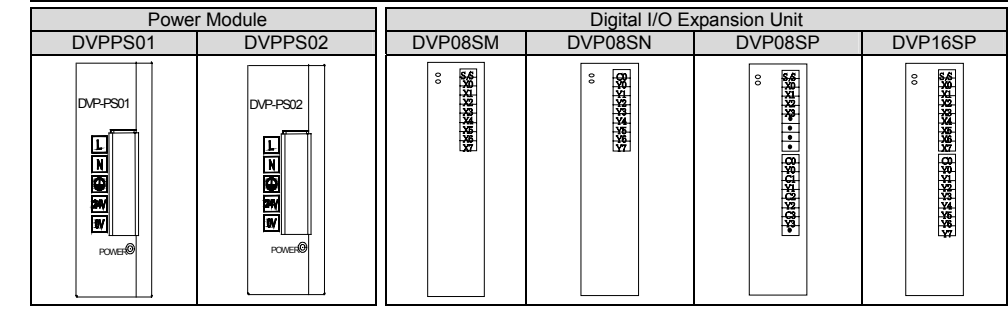
**☉ Analog / Temperature Module Expansion Unit**

Model	Power	Input / Output	Profile reference	
DVP04AD-S	24VDC	4 in/0 out	14-bit resolution, -10~+10V (1.25mV) or -20~+20mA (5 μA)	
DVP02DA-S		0 in/2 out	12-bit resolution, 0~+10V (2.5mV) or 0~+20mA (5 μA)	
DVP04DA-S		0 in/4 out	12-bit resolution, 0~+10V (2.5mV) or 0~+20mA (5 μA)	
DVP06XA-S		4 in/2 out	12-bit resolution, AI: -10~+10V (5mV) or -20~+20mA (20 μA) 12-bit resolution, AO: 0~+10V (2.5mV) or 0~+20mA (5 μA)	
DVP04PT-S		4 in/0 out	-200~+600°C (0.1°C) or -328~1112°F (0.18°F)	
DVP04TC-S		4 in/0 out	J type: -100~700°C (0.1°C) or type: -100~1000°C (0.1°C)	
DVP08RT-S		8 in/0 out	-20~+160°C (0.1°C) or -4~320°F (0.18°F)	

☉ For detail electrical specification of Special Expansion Modules, please see their individual user's manual

**☉ Power Output Module**

Model	Input / Output		Profile reference
	Input power	Input power	
DVPPS01	100~240VAC (50/60Hz)	Output Voltage: 24VDC Max. Output current: 1A	
DVPPS02	100~240VAC (50/60Hz)	Output Voltage: 24VDC Max. Output current: 2A	



**9 TROUBLESHOOTING**

☉ Judge the errors by the indicators on the front panel. When errors occurred on DVP PLC, please check:

☉ "POWER" LED  
 There is a "POWER" LED at the front of the MPU. When the MPU is powered On, the green LED light will be on. If the indicator is not on when the MPU is powered up and with the input power being normal, it is an indication that the PLC is out of order. Please have this machine replaced or have it repaired at a dealer near you.

☉ "RUN" LED  
 Identify the status of the PLC. When the PLC is in operation, this light will be on, and users could thus use HPP or the editing program of the ladder diagram to give commands to make the PLC "RUN" or "STOP".

☉ "ERROR" LED  
 If incorrect programs are input to the MPU, or that the commands and the components exceed the allowable range, the indicator will blink. At this moment, the user should check both the error codes saved in the MPU data register D1004 and the Error Code Table below to correct the programs. The address that the error occurs will be stored in data register D1137 (the address saved in D1137 is invalid in case of common loop error). When the ERROR LED is on (not blinking), users should make a judgment from the special relay M1008 of the MPU. If it is On, it indicates that the execution time of the program loop has exceeded the time-out setting (set by D1000). Please turn the PLC RUN/STOP switch to STOP, and find out the address of the time-out program by special data register D1008. "WDT" command can be used to solve the problem.

☉ "BAT.LOW" LED  
 When the battery voltage is low, the "BAT.LOW" LED will be on, and the battery should be replaced as soon as possible; otherwise the user program and the data in latched area will be lost. (On the unplugged PLC, please change the battery within 3 minutes to retain the PLC's internal user programs and data).

☉ "Input" LED  
 The On/Off signals of the input point could be displayed through the "Input" LED, or the status of the input point could be monitored through the device monitoring function of HPP.

☉ "Output" LED  
 Output LED indicates if the output signals are On or Off. Please check the following items when the LED On/Off indication does not correspond to the commands: 1. Output contacts may be melted and stuck together due to a short circuit or current overload. 2. Check wiring and verify that the screws are tight.

☉ Error Code (D1004, Hexadecimal Number) Table

Code	Explanation	Code	Explanation	Code	Explanation
0001	Device S exceeds the usage limit	0E04	C register exceeds the usage limit	C404	FOR-NEXT exceeds 6 levels
0002	Misused Label P	0E05	Misused operand CXXX of DCNT	C405	Misused STL/RET
0003	KnSm exceeds the usage limit	0E0F	Index registers E and F exceed the usage limit		Misused SRET/IRET
0102	Misused Label I	0E18	BCD conversion error		Misused MC/MCR
0202	Misused MC	0E19	Division Error (divisor=0)		Misused END/FEND
0302	Misused MCR	0E1A	STL has been used for more than 9 times consecutively	C407	Component exceeds the usage limit (including E and F error)
0401	Device X exceeds the usage limit	0E1B	The root is negative	C408	MC/MCR used within STL
0403	KnXm exceeds the usage limit	0E1C	FROM/TO communication error		I/P used within STL
0501	Device Y exceeds the usage limit	0F04	D register exceeds the usage limit	C409	STL/RET used within Subroutine
0503	KnYm exceeds the usage limit	0F05	Misused operand DXXXX of DCNT		STL/RET used within the Interrupt Service Routine
0601	Device T exceeds the usage limit	0F06	Misused SFTR operands	C40A	Misused MC/MCR (Subroutine)
0604	T register exceeds the usage limit	0F07	Misused SFTL operands		Misused MC/MCR (ISR)
0801	Device M exceeds the usage limit	0F08	Misused REF operands	C40B	MC/MCR does not begin from N0 nor of continuous status
0803	KnMm exceeds the usage limit	0F09	Misused WSFR, WSFL operands	C40C	Misused MC/MCR
0D01	Misused DECO operands	0F0A	Misused TTMR, STMR commands	C40D	Use I/P incorrectly
0D02	Misused ENCO operands	0F0B	SORT command exceeds the usage times limit	C40E	IRET does not go after the last FEND command
0D03	Misused DHSCS operands	0F0C	TKY command exceeds the usage times limit		SRET does not go after the last FEND command
0D04	Misused DHSCR operands	0F0D	HKY command exceeds the usage time limit	C41C	I/O points of the expansion unit exceed the limit
0D05	Misused PLSY operands	1000	Misused ZRST operands	C41D	Special expansion module exceeds the limit
0D06	Misused PWM operands	C400	Illegitimate commands	C41E	Error setting of Ext. module
0D07	Misused FROM/TO operands	C401	Loop error	C41F	Data write in memory failure
0D08	Misused PID operands	C402	Misused LD / LDI commands	C4FF	Invalid command
0D09	Misused DHSZ operands	C403	Misused MPS commands	C4EE	Missing END statement
0E01	Device C exceeds the usage limit				