

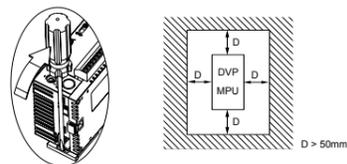


### 3.3 Installation of the DIN rail

The 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 remove it, pull down the retaining clip and gently pull the PLC away from the DIN rail. As shown on the right:

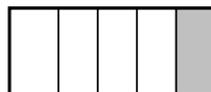
When installing the PLC, make sure that it is installed in an enclosure with sufficient space (as shown on the right) to its surroundings so as to allow heat dissipation.



### 3.4 Input/Output points numbering order

No matter how many points of MPU, the input of the first I/O extension unit will start from X20 and output will start from Y20.

System combined Example:



MPU EXT1 EXT2 EXT3 EXT4

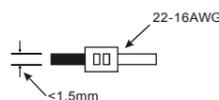
PLC	Models	Input Points	Output Points	Input Numbering	Output Numbering
MPU	SS/SA/SX/SC	8	4/6	X0~X7	Y0~Y5
EXT1	DVP16SP11T	8	8	X20~X27	Y20~Y27
EXT2	DVP08SM11N	8	0	X30~X37	-
EXT3	DVP06SM11R	0	6	-	Y30~Y35
EXT4	DVP08SP11R	4	4	X40~X43	Y40~Y43

Extension unit 3 DVP06SM11R will be used as 8 outputs, the higher 2 numbers of output points have no corresponding output points.

Extension unit 4 DVP08SP11R will be used as 8 input points/8 output points, the higher part numbers of inputs points and output points have no corresponding input/output points. It is recommended to place them at the end of serial wiring, so that I/O points numbering will be continuous.

### 3.5 Wiring

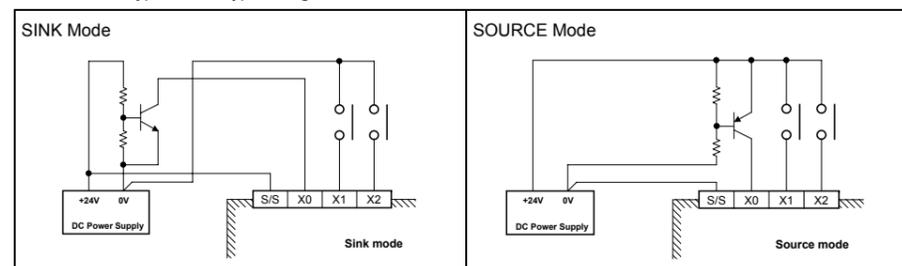
Notes:



- 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 1.95 kg-cm (1.7 in-lbs). Use Copper Conductor Only, 60/75 °C.
- I/O signal wires or power supply should not run through the same multi-wire cable or conduit.

### 3.6 Input Point Wiring

There are two types of DC type wiring: SINK and SOURCE, defined as follows:

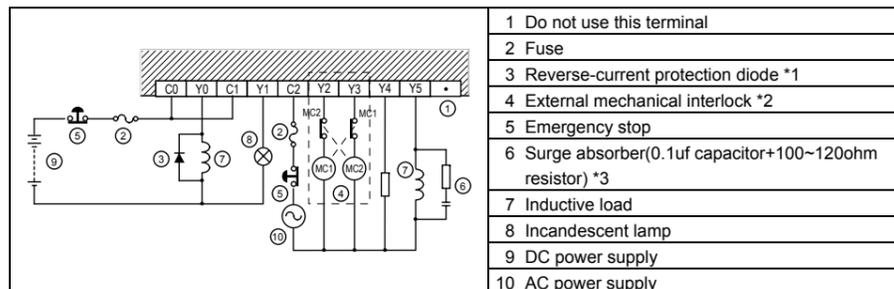


### 3.7 AC Type Wiring

Input Circuit Connection	110V AC Input Specifications
<p>DVP08SM10N</p>	Input voltage
	85~132VAC 50~60Hz
	Input impedance
	14.5Kohm/50Hz 12Kohm/60Hz
	Input current
	9.2mA 110VAC/60Hz
On/Off voltage level	
greater than 80VAC less than 30VAC	
Response time	
Off→On 15us On→Off 20us	
Circuit isolation/Operation indication	
Photocoupler/LED On	

### 3.8 Output Point Wiring

#### ■ The Relay Output Circuit Wiring



- Do not use this terminal
- Fuse
- Reverse-current protection diode \*1
- External mechanical interlock \*2
- Emergency stop
- Surge absorber(0.1uf capacitor+100~120ohm resistor) \*3
- Inductive load
- Incandescent lamp
- DC power supply
- AC power supply

\*1: This PLC does not have any internal protection circuitry on the relay outputs. For switching direct current on inductive loads, a reverse-current protection diode should be installed in parallel with the load. The relay contact life decreases significantly if this is not done.

The reverse-current protection diode needs to satisfy the following specifications.

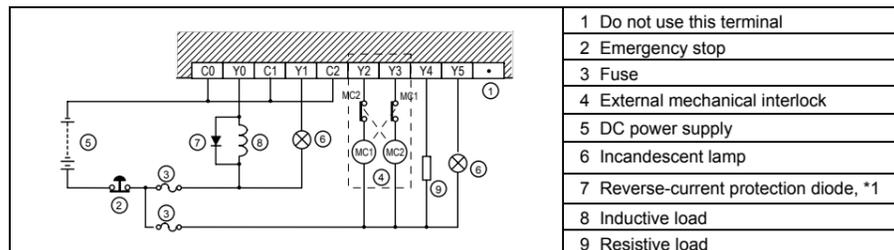
- The diode is rated for maximum reverse voltage of 5~10+ times the load voltage.

- The forward current is more that the load current

\*2: Ensure all loads are applied to the same side of each PLC output, see above figure. Loads which should NEVER simultaneously operate(e.g. direction control of a motor), because of a critical safety situation, should not rely on the PLC's sequencing alone. Mechanical interlocks MUST be fitted to all critical safety circuits.

\*3: This PLC does not have any internal protection circuitry on the relay output. For switching AC on inductive loads, a surge absorber (0.1uF + "100ohm to 120ohm") should be installed in parallel with the load. The relay contact life decreases significantly if this is not done. Besides protecting the internal circuitry of the PLC, a surge absorber decreases the noise emissions to the load.

#### ■ The Transistor Output Circuit Wiring



- Do not use this terminal
- Emergency stop
- Fuse
- External mechanical interlock
- DC power supply
- Incandescent lamp
- Reverse-current protection diode, \*1
- Inductive load
- Resistive load

\*1: Ensure all loads are applied to the same side of each PLC output, see above figure. Loads which should NEVER simultaneously operate (e.g. direction control of a motor), because of a critical safety situation, should not rely on the PLC's sequencing alone. Mechanical interlocks MUST be fitted to all critical safety circuits.

\*2: Transistor outputs use internal zener diode(39V) as protection circuitry. When driving the inductive load with transistor output, a reverse-current protection diode can be installed in parallel with the load if necessary.

The reverse-current protection diode needs to satisfy the following specifications.

- The diode is rated for maximum reverse voltage of 5 to 10+ times the load voltage.

- The forward current is more than the load current.

### 4 TRIAL RUN

#### 4.1. Before Turning ON the Power

After wiring, be sure to check the items below before turning ON the power supply to the PLC.

Item	Description
Unit mounting status	- Does the unit type match the device list during the design stage? - Are all of the units firmly attached?
Power supply	- Is operating voltage supplied correctly? - Is the power supply cable properly connected? - Are both voltage and polarity connected correctly for each connection? - Protection against excess current: when overloaded, output voltage lowers. Although the output voltage will return to normal when the load returns to normal, be careful as long overloads or short-circuits will cause deterioration or destruction of internal elements. - Attaching additional power supply units in parallel is not allowed! It may destroy internal elements and the load of the power supply.

Check input/output terminals	- Does the wiring of connector and terminal match? - Is the operating voltage of I/O correct? - Are the connectors of I/O properly connected? - Is the wire size correct?
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Note: These precautions concern the DVP-PS01/PS02 power supply unit specifically.

#### 4.2. Turning the Power ON

After checking the items given on the section 5, perform the trial operation by adhering to the following procedure.

- Check "POWER" LED at the front of the PLC extension unit.
- Check "LV" LED at the front of the PLC extension unit.

#### 4.3. Check Communication with PLC control unit

After Power on and PLC is completing initial setup. The total number of extensive input/output points will be stored in special data registers of D1142 and D1143. Please check D1142 and D1143 to confirm the adding extension unit is connecting with control unit normally.

### 5 TROUBLESHOOTING

#### 5.1 All LEDs are OFF

- Check the power supply wiring.
- Check if the power supplied to the PLC control units is in the range of the rating. Be sure to check the fluctuation in the power supply.
- Disconnect the power supply wiring to the other devices if the power supplied to the PLC control unit is shared with them.
  - If the LEDs on the PLC control unit turn ON at this moment, the capacity of the power supply is not enough to control other devices as well. Prepare another power supply for other devices or increase the capacity of the power supply.

#### 5.2 Diagnosing Input Malfunction

- Check the wiring of the input devices (input indicator LEDs are OFF)
  - Check that the power is properly supplied to the input terminals.
    - If the power is properly supplied to the input terminal, there is probably an abnormality in the PLC's input circuit. Please contact your dealer.
    - If the power is not properly supplied to the input terminal, there is probably an abnormality in the input device or input power supply. Check the input device and input power supply.
- Check the input condition (input indicator LEDs are ON)
  - Monitor the input condition using a programming tool.
    - If the input monitored is OFF, there is probably an abnormality in the PLC's input circuit. Please contact your dealer.
    - If the input monitored is ON, check the program again. Also, check the leakage current at the input devices (e.g. two-wire sensor) and check for the duplicated use of output or the program flow when a control instruction such as MC or CJ is used.
- Check the settings of the I/O allocation.

#### 5.3 Diagnosing Output Malfunction

- Check the wiring of the loads. (output indicator LEDs are ON)
  - Check if the power is properly supplied to the loads.
    - If the power is properly supplied to the load, there is probably an abnormality in the load. Check the load again.
    - If the power is not supplied to the load, there is probably an abnormality in the PLC's output circuit. Please contact your dealer.
- Check of output condition (output indicator LEDs are OFF)
  - Monitor the output condition using a programming tool.
    - If the output monitored is turned ON, there is probably a duplicated output error.
  - Forcing ON the output using a programming tool.
    - If the output indicator LED is turned ON, go to input condition check.
    - If the output LED remains OFF, there is probably an abnormality in the PLC's output circuit. Please contact your dealer.