

# *DVP-EC3*

## INSTRUCTION SHEET

安裝說明  
安装说明

- ▲ *Programmable Logic Controller*
- ▲ 可程式控制器
- ▲ 可编程控制器

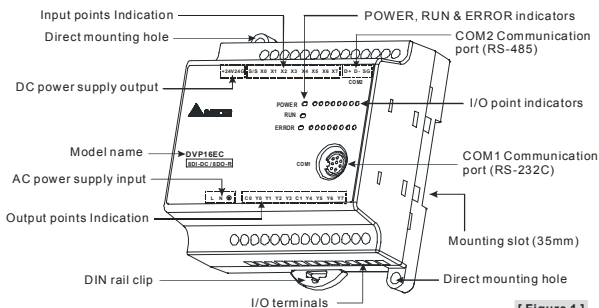


<http://www.delta.com.tw/industrialautomation>

Thank you for choosing Delta DVP-EC3 series programmable logic controller. DVP-EC3 currently offers 10 ~ 60 I/O points. To ensure proper installation, operation and maintenance, please read this instruction sheet carefully and provide users with this instruction sheet before installing DVP-EC3.

- ✓ This instruction sheet provides only information on the electrical specification, general functions, installation and wiring. The program design and applicable instructions for DVP-EC3 are the same as those applicable for DVP-ES series. For detailed information, please refer to "DVP-PLC Application Manual: Programming". For details of the optional peripheral, please refer to the instruction sheet enclosed in the package.
- ✓ DVP-EC3 series PLC is an OPEN TYPE device and therefore should be installed in an enclosure free of airborne dust, humidity, electric shock and vibration. The enclosure should prevent non-maintenance staff from operating the device (e.g. key or specific tools are required for operating the enclosure) in case danger and damage on the device may occur.
- ✓ DO NOT connect the input AC power supply to any of the I/O terminals; otherwise serious damage may occur. Check all the wiring again before switching on the power. Make sure the ground terminal  $\oplus$  is correctly grounded in order to prevent electromagnetic interference.

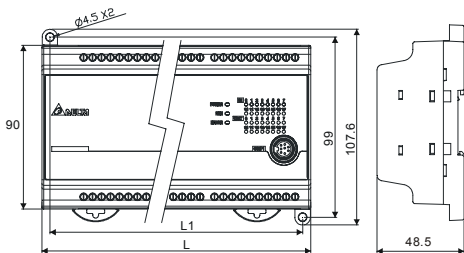
## ■ Product Profile & Dimension



[ Figure 1 ]

Note1: The above figure is the layout of DVP16EC00R3.

Note2: DVP60EC00R3/T3 is equipped with removable I/O terminal block; other models are equipped with fixed terminal block.



[ Figure 2 ]

Unit: mm

Model	10EC 00□3	14EC 00□3	16EC 00□3	20EC 00□3	24EC 00□3	30EC 00□3	32EC 00□3	40EC 00□3	60EC 00□3
L	95			150				164	240
L1	86			141				155	231

## ■ Electrical Specifications

Model Item	10EC 00□3	14EC 00□3	16EC 00□3	20EC 00□3	24EC 00□3	30EC 00□3	32EC 00□3	40EC 00□3	60EC 00□3
Power supply voltage	100 ~ 240VAC (-15% ~ 10%), 50/60Hz ± 5%								
Operation	DVP-EC3 starts to run when the power supply rises to 95 ~ 100V AC and stops when the power supply drops to 70V AC. It continues to run for 10ms after the power supply is cut off.								
Power supply fuse	2A/250VAC								
Power consumption	12VA			15.6VA				22.5VA	
DC24V current output	200mA			300mA				400mA	
Power supply protection	DC24V output short circuit protection								
Voltage withstand	1,500VAC (Primary-secondary), 1,500VAC (Primary-PE), 500VAC (Secondary-PE)								
Insulation resistance	> 5MΩ at 500VDC (between all I/O points and earth)								
Noise immunity	ESD: 8KV Air Discharge EFT: Power Line: 2KV, Digital I/O: 1KV, Analog & Communication I/O: 250V RS: 26MHz ~ 1GHz, 10V/m								
Grounding	The diameter of grounding wire shall not be less than that of L, N terminal of the power supply. (When many PLCs are in use at the same time, please make sure every PLC is properly grounded.)								
Operation/storage	Operation: 0°C~55°C (temperature), 50~95% (humidity), pollution degree 2 Storage: -25°C~70°C (temperature), 5~95% (humidity)								
Agency approvals	UL508 European community EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC								
Vibration/shock immunity	International standards: IEC61131-2, IEC 68-2-6 (TEST Fc)/ IEC61131-2 & IEC 68-2-27 (TEST Ea)								
RS-485 comm. mode	Not supported			Supported					
Weight (R/T)	192g 180g	202g 185g	212g 190g	255g 230g	275g 240g	280g 245g	290g 250g	340g 300g	510g 450g

Input Points				
Input no.	X0, X1		X2 ~ X17	X20 ~ #1
Input point type	Digital input			
Input type	DC (SINK or SOURCE)			
Input current	24VDC, 5mA			
Max. frequency	20kHz		10kHz	60Hz
Action level	Off → On	> 15VDC		
	On → Off	< 5VDC		

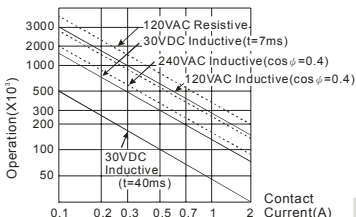
Input Points				
Response time	Off → On	< 25us	< 50us	< 10ms
	On → Off	< 10us	< 20us	< 15ms
Filter time	X0 ~ X17	Approx. 10ms (0 ~ 20ms adjustable in D1020, D1021)		

Output Points			
Output point type		Relay-R	Transistor-T
Voltage specification		< 240VAC, 30VDC	5 ~ 30VDC #2
Max. frequency		1Hz	1kHz
Maximum load	Resistive	2A/1 point (5A/COM)	0.5A/1 point (2A/COM) #4
	Inductive	#3	15W (30VDC)
	Lamp	20WDC/100WAC	2.5W (30VDC)
Response time	Off → On	Approx. 10 ms	< 30us
	On → Off		< 350us

#1: Please refer to "I/O Terminal Layout" for the max. X/Y No. on each model.

#2: UP, ZP must work with external auxiliary power supply 24VDC (-15% ~ +20%), rated consumption approx. 1mA/point.

#3: Life curves



[ Figure 3 ]

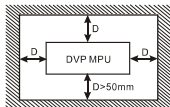
#4: ZP for NPN COM, UP for PNP COM.

## ■ Installation

Please install the PLC in an enclosure with sufficient space around it to allow heat dissipation, as shown in the figure.

• **Direct Mounting:** Please use M4 screw according to the dimension of the product.

• **DIN Rail Mounting:** When mounting the PLC to 35mm DIN rail, be sure to use the retaining clip to stop any side-to-side movement of the PLC and reduce the chance of wires being loose. The retaining clip is at the bottom of the PLC. To secure the PLC to DIN rail, pull down the clip, place it onto the rail and gently push it up. To remove the PLC, pull the retaining clip down with a flat screwdriver and gently remove the PLC from DIN rail.



## ■ Wiring

- Use the 12-24 AWG single-core bare wire or the multi-core wire for the I/O wiring. The PLC terminal screws should be tightened to 3.80 kg-cm (3.30 in-lbs) and please use 60/75°C copper conductor only.
- DO NOT wire empty terminal. DO NOT place the input signal wire and output power wire in the same wiring circuit.
- DO NOT drop tiny metallic conductor into the PLC while screwing and wiring.

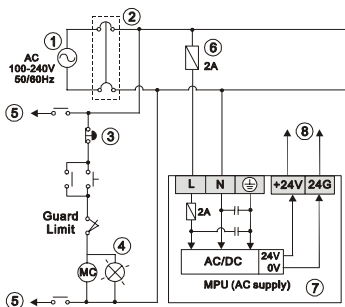
## ◆ Power Supply

The power supply input for DVP-EC3 model is AC input. When operating DVP-EC3, please note the following points:

1. The range of the input voltage should be 100 ~ 240VAC. The power supply should be connected to L and N terminals. Please note that wiring AC110V or AC220V to +24V output terminal or digital input points will result in serious damage on the PLC.
2. Use 1.6mm wire (or longer) for the grounding of the PLC.
3. The power shutdown of less than 10ms will not affect the operation of the PLC. However, power shutdown time that is too long or the drop of power supply voltage will stop the running of the PLC, and all outputs will go "OFF". When the power returns to normal status, the PLC will automatically resume operation. (Care should be taken on the latched auxiliary relays and registers inside the PLC when programming.)
4. For max. output of the +24V power supply output terminal for each model, please refer to the electrical specification table. DO NOT connect other external power supplies to this terminal. Every input point requires 5 ~ 7mA to drive when powered by rated voltage 24 ~ 30V (i.e. 16 input points will require 80 ~ 112mA to drive). The +24V input on DVP-EC3 is only for digital input points; other external loads are not suggested.

## ◆ Safety Wiring

In PLC control system, many devices are controlled at the same time and actions of any device could influence each other, i.e. breakdown of any device may cause the breakdown of the entire auto-control system and danger. Therefore, we suggest you wire a protection circuit at the power supply input terminal. See the figure below.



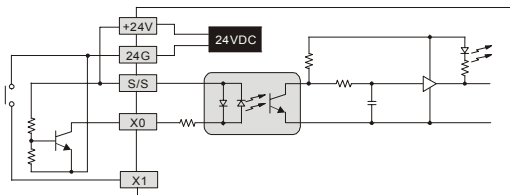
[ Figure 4 ]

- |   |                                  |
|---|----------------------------------|
| ① AC power supply:100 ~ 240VAC, 50/60Hz   | ② Breaker                        |
| ③ Emergency stop: This button cuts off the system power supply when accidental emergency takes place. |                                  |
| ④ Power indicator   | ⑤ AC power supply load           |
| ⑥ Power supply circuit protection fuse (2A)   | ⑦ DVP-PLC (main processing unit) |
| ⑧ DC power supply output: 24VDC   |                                  |

## ◆ I/O Point Wiring

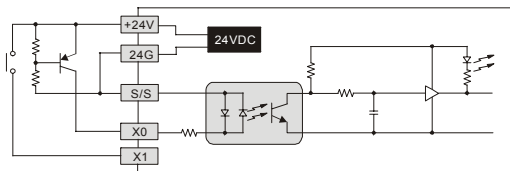
There are 2 types of DC inputs, SINK and SOURCE. (See the example below. For detailed point configuration, please refer to the specification of each model.)

- DC Signal IN – SINK mode  
Input point loop equivalent circuit



[ Figure 5 ]

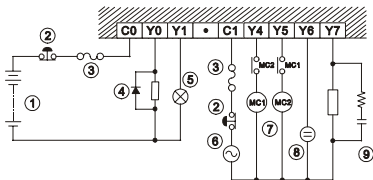
- DC Signal IN – SOURCE mode  
Input point loop equivalent circuit



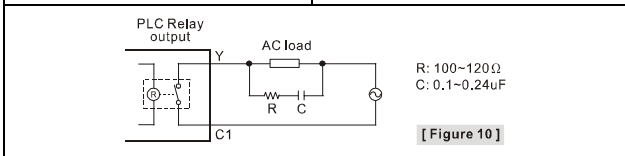
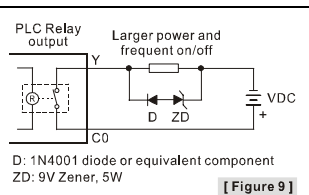
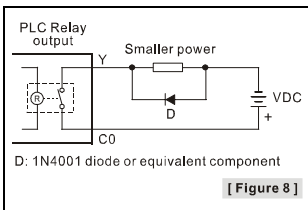
[ Figure 6 ]

Below is an example. For detailed point configuration, please refer to specifications of each model.

- Relay (R) output circuit wiring

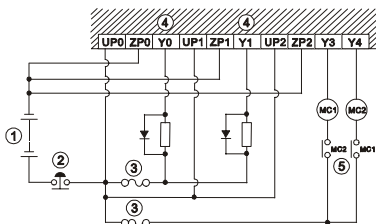


[ Figure 7 ]

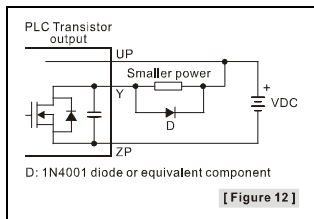


- ① DC power supply
  - ② Emergency stop: Uses external switch
- 
- ③ Fuse: Uses 5 ~ 10A fuse at the shared terminal of output contacts to protect the output circuit
- 
- ④ Transient voltage suppressor: To extend the life span of contact.
    1. Diode suppression of DC load: Used when in smaller power (Figure 8)
    2. Diode + Zener suppression of DC load: Used when in larger power and frequent On/Off (Figure 9)
- 
- ⑤ Incandescent light (resistive load)
  - ⑥ AC power supply
- 
- ⑦ Manually exclusive output: For example, Y4 and Y5 control the forward running and reverse running of the motor, forming an interlock for the external circuit, together with the PLC internal program, to ensure safe protection in case of any unexpected errors.
- 
- ⑧ Neon indicator
- 
- ⑨ Absorber: To reduce the interference on AC load (Figure 10)

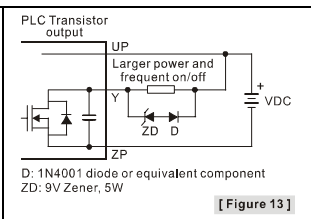
• Transistor (T) output circuit wiring



[ Figure 11 ]



[ Figure 12 ]

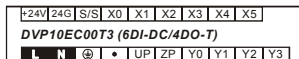
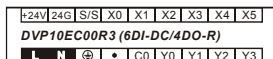


[ Figure 13 ]

- ① DC power supply
  - ② Emergency stop
  - ③ Circuit protection fuse
- 
- ④ The output of the transistor model is "open collector". If Y0/Y1 is set to pulse output, the output current has to be 0.05 ~ 0.5A to ensure normal operation of the model.
    1. Diode suppression: Used when in smaller power (Figure 12)
    2. Diode + Zener suppression: Used when in larger power and frequent On/Off (Figure 13)
- 
- ⑤ Manually exclusive output: For example, Y3 and Y4 control the forward running and reverse running of the motor, forming an interlock for the external circuit, together with the PLC internal program, to ensure safe protection in case of any unexpected errors.

## ■ I/O terminal layout

• DVP10EC00R3/T3



• DVP14EC00R3/T3

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7					
<b>DVP14EC00R3 (8DI-DC/6DO-R)</b>															
<b>L</b>	<b>N</b>	⊕	•	C0	Y0	Y1	Y2	Y3	C1	Y4	Y5				

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7					
<b>DVP14EC00T3 (8DI-DC/6DO-T)</b>															
<b>L</b>	<b>N</b>	⊕	•	UP	ZP	Y0	Y1	Y2	Y3	Y4	Y5				

• DVP16EC00R3/T3

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	D+	D-	SG			
<b>DVP16EC00R3 (8DI-DC/8DO-R)</b>																
<b>L</b>	<b>N</b>	⊕	•	C0	Y0	Y1	Y2	Y3	C1	Y4	Y5	Y6	Y7			

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	D+	D-	SG			
<b>DVP16EC00T3 (8DI-DC/8DO-T)</b>																
<b>L</b>	<b>N</b>	⊕	•	UP	ZP	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7			

• DVP20EC00R3/T3

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	•	•	•	•			
<b>DVP20EC00R3 (12DI-DC/8DO-R)</b>																			⇒		
<b>L</b>	<b>N</b>	⊕	•	C0	Y0	Y1	Y2	Y3	C1	Y4	Y5	Y6	Y7								

•	•	D+	D-	SG			
---	---	----	----	----	--	--	--

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	•	•	•	•			
<b>DVP20EC00T3 (12DI-DC/8DO-T)</b>																			⇒		
<b>L</b>	<b>N</b>	⊕	•	UP0	ZP0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7								

•	•	D+	D-	SG			
---	---	----	----	----	--	--	--

• DVP24EC00R3/T3

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	•	•	•	•			
<b>DVP24EC00R3 (12DI-DC/12DO-R)</b>																			⇒		
<b>L</b>	<b>N</b>	⊕	•	C0	Y0	Y1	Y2	Y3	C1	Y4	Y5	Y6	Y7	C2	Y10	Y11	Y12	Y13			

•	•	D+	D-	SG			
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+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	•	•	•	•			
<b>DVP24EC00T3 (12DI-DC/12DO-T)</b>																			⇒		
<b>L</b>	<b>N</b>	⊕	•	UP0	ZP0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	UP1	ZP1	Y10	Y11	Y12			

•	•	D+	D-	SG			
---	---	----	----	----	--	--	--

Y13

• DVP30EC00R3/T3

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	X14	X15	X16	X17			
<b>DVP30EC00R3 (18DI-DC/12DO-R)</b>																			⇒		
<b>L</b>	<b>N</b>	⊕	•	C0	Y0	Y1	Y2	Y3	C1	Y4	Y5	Y6	Y7	C2	Y10	Y11	Y12	Y13			

X20	X21	D+	D-	SG			
-----	-----	----	----	----	--	--	--



+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	X14	X15	X16	X17				
<b>DVP30EC00T3 (18DI-DC/12DO-T)</b>																						
L	N	⊕	•	UP0	ZP0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	UP1	ZP1	Y10	Y11	Y12				
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X20</td><td>X21</td><td>D+</td><td>D-</td><td>SG</td> </tr> </table>																		X20	X21	D+	D-	SG
X20	X21	D+	D-	SG																		
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Y13</td> </tr> </table>																		Y13				
Y13																						

• DVP32EC00R3/T3

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	X14	X15	X16	X17				
<b>DVP32EC00R3 (16DI-DC/16DO-R)</b>																						
L	N	⊕	•	C0	Y0	Y1	Y2	Y3	C1	Y4	Y5	Y6	Y7	C2	Y10	Y11	Y12	Y13				
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>•</td><td>•</td><td>D+</td><td>D-</td><td>SG</td> </tr> </table>																		•	•	D+	D-	SG
•	•	D+	D-	SG																		
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C3	Y14	Y15	Y16	Y17																		

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	X14	X15	X16	X17				
<b>DVP32EC00T3 (16DI-DC/16DO-T)</b>																						
L	N	⊕	•	UP0	ZP0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	UP1	ZP1	Y10	Y11	Y12				
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>•</td><td>•</td><td>D+</td><td>D-</td><td>SG</td> </tr> </table>																		•	•	D+	D-	SG
•	•	D+	D-	SG																		
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Y13</td><td>Y14</td><td>Y15</td><td>Y16</td><td>Y17</td> </tr> </table>																		Y13	Y14	Y15	Y16	Y17
Y13	Y14	Y15	Y16	Y17																		

• DVP40EC00R3/T3

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	X14	X15	X16	X17							
<b>DVP40EC00R3 (24DI-DC/16DO-R)</b>																									
L	N	⊕	•	C0	Y0	Y1	Y2	Y3	C1	Y4	Y5	Y6	Y7	C2	Y10	Y11	Y12	Y13							
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X20</td><td>X21</td><td>X22</td><td>X23</td><td>X24</td><td>X25</td><td>X26</td><td>X27</td> </tr> </table>																		X20	X21	X22	X23	X24	X25	X26	X27
X20	X21	X22	X23	X24	X25	X26	X27																		
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>C3</td><td>Y14</td><td>Y15</td><td>Y16</td><td>Y17</td><td>D+</td><td>D-</td><td>SG</td> </tr> </table>																		C3	Y14	Y15	Y16	Y17	D+	D-	SG
C3	Y14	Y15	Y16	Y17	D+	D-	SG																		

+24V	24G	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	X14	X15	X16	X17							
<b>DVP40EC00T3 (24DI-DC/16DO-T)</b>																									
L	N	⊕	•	UP0	ZP0	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	UP1	ZP1	Y10	Y11	Y12							
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X20</td><td>X21</td><td>X22</td><td>X23</td><td>X24</td><td>X25</td><td>X26</td><td>X27</td> </tr> </table>																		X20	X21	X22	X23	X24	X25	X26	X27
X20	X21	X22	X23	X24	X25	X26	X27																		
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Y13	Y14	Y15	Y16	Y17	D+	D-	SG																		

• DVP60EC00R3/T3

L	N	⊕	•	S/S	X0	X1	X2	X3	X4	X5	X6	X7	X10	X11	X12	X13	X14	X15	X16	X17																				
<b>DVP60EC00R3 (36DI-DC/24DO-R)</b>																																								
+24V	24G	C0	Y0	Y1	Y2	Y3	C1	Y4	Y5	Y6	Y7	C2	Y10	Y11	Y12	Y13	C3	Y14	Y15	Y16																				
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>X20</td><td>X21</td><td>X22</td><td>X23</td><td>X24</td><td>X25</td><td>X26</td><td>X27</td><td>X30</td><td>X31</td><td>X32</td><td>X33</td><td>X34</td><td>X35</td><td>X36</td><td>X37</td><td>X40</td><td>X41</td><td>X42</td><td>X43</td> </tr> </table>																					X20	X21	X22	X23	X24	X25	X26	X27	X30	X31	X32	X33	X34	X35	X36	X37	X40	X41	X42	X43
X20	X21	X22	X23	X24	X25	X26	X27	X30	X31	X32	X33	X34	X35	X36	X37	X40	X41	X42	X43																					
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