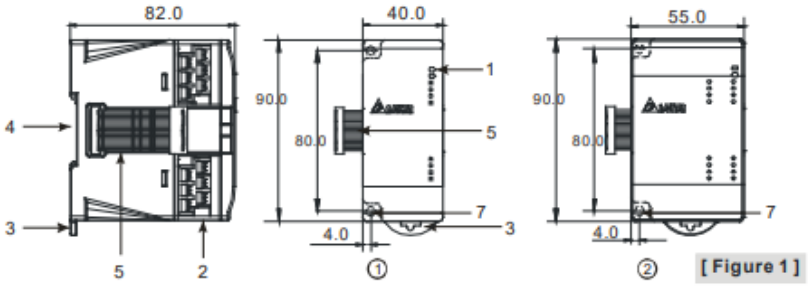
DELTA DVP-EH Series Programmable Logic Controllers Instruction Manual

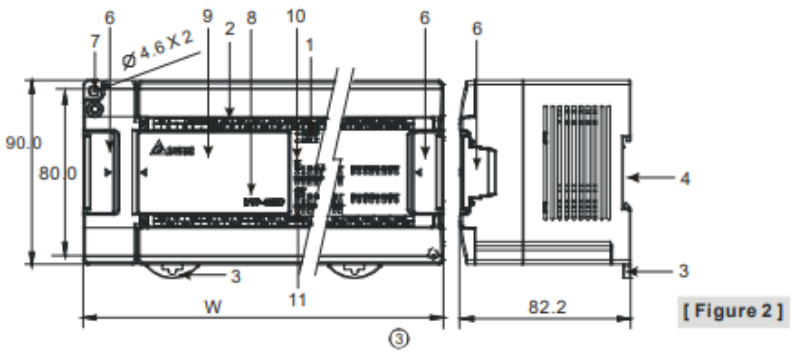
Contents

DELTA DVP-EH Series Programmable Logic Controllers Instruction Manual

This Instruction Sheet only provides descriptions for electrical specifications, general specifications, installation & wiring. Other detail infromation about programming and intructions, please see “DVP-PLC Application Manual: Programming”. For more information about the optional peripherals, please see individual product instuction sheet or “DVP-PLC Application Manual: Special I/O Modules”. The DVP-EH series main processing units offer 8 ~ 48 points and the maximum input/output can be extended up to 256 points.
DVP-EH DIDO 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 AC main circuit power supply to any of the input/output terminals, or it may damage the PLC. Check all the wiring prior to power up. To prevent any electromagnetic noise, make sure the PLC is properly grounded . Do NOT touch terminals when power on.

Product Profile & Dimension





Model name	08HM 11N	16HM 11N	08HN 11R/T	16HP 11R/T	32HM 11N	32HN 00R/T	32HP 00R/T	48HP 00R/T
W	40	55	40	55	143.5	143.5	143.5	174
H	82	82	82	82	82.2	82.2	82.2	82.2
Type		,		,	*f*	*f*	*f*	*f*

1. Power, LV indicators	5. Extension wiring	9. Cover
2. I/O terminals	6. Extension port cover	10. Input indicators
3. DIN rail clip	7. Direct mounting holes	11. Output indicators
4. DIN rail	8. Model name	

Electrical Specifications

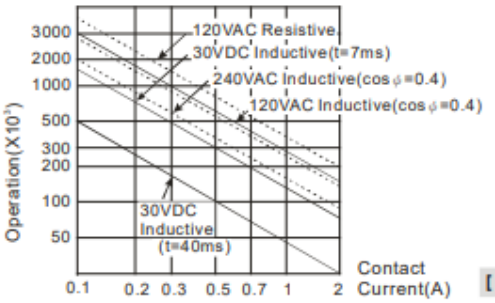
Model Item	08HM11N 16HM11N 32HM11N	08HN11R 08HP11T	08HP11R 08HP11T	16HP11R 16HP11T	32HN00R 32HN00T	32HP00R 32HP00T	48HP00R 48HP00T
Power supply voltage	24VDC (20.4 ~ 28.8VDC) (-15% ~ 20%)				100~240VAC (-15%~10%), 50/60Hz ± 5%		
Fuse capacity	2A/250VAC						
Power consumption	1W/1.5W /3.9W	1.5W	1.5W	2W	30VA	30VA	30VA
DC24V current output	NA	NA	NA	NA	NA	500mA	500mA

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 ground)						
Noise immunity	ESD: 8KV Air Discharge EFT: Power Line: 2KV, Digital I/O: 1KV, Analog & Communication I/O: 250V Digital I/O: 1KV, 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), 5~95% (humidity), pollution degree 2 Storage: -25°C~70°C (temperature), 5~95% (humidity)						
Vibration/shock immunity	International standards: IEC61131-2, IEC 68-2-6 (TEST Fc)/ IEC61131-2 & IEC 68-2-27 (TEST Ea)						
Weight (g)	124/160/ 355	130/120	136/116	225/210	660/590	438/398	616/576
Approvals							

Input point		
Input point type		DC
Input type		DC (SINK or SOURCE)
Input current		24VDC 5mA
Active level	Off→On	above 16.5VDC
	On→Off	below 8VDC
Response time		About 20ms
Circuit isolation /operation indicator		Photocoupler/LED On

Output point			
Output point type		Relay-R	Transistor-T
Voltage specification		Below 250VAC, 30VDC	30VDC
Maximum load	Resistive	1.5A/1 point (5A/COM)	55°C 0.1A/1point, 50°C 0.15A/1point, 45°C 0.2A/1point, 40°C 0.3A/1point (2A/COM)
	Inductive	#1	9W (30VDC)
	Lamp	20WDC/100WAC	1.5W (30VDC)
Response time	Off→On	About 10ms	15us
	On→Off		25us

#1: Life curves

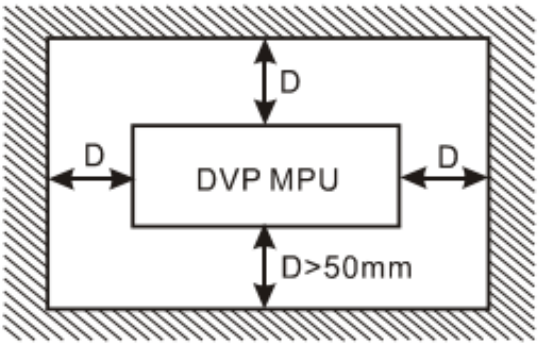


[Figure 3]

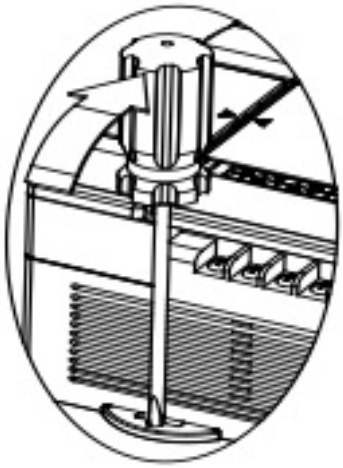
Digital Input/Output Modules

Model	Power	Input unit		Output unit	
		Points	Type	Points	Type
DVP08HM11N	24VDC	8	DC Type Sink/Source	0	N/A
DVP16HM11N		16		0	
DVP32HM11N		32		0	
DVP08HN11R		0		8	Relay: 250VAC/30VDC 2A/1point
DVP08HP11R		4		4	
DVP16HP11R		8		8	
DVP08HN11T		0		8	Transistor: 5 ~ 30VDC 0.3A/1point at 40°C
DVP08HP11T		4		4	
DVP16HP11T		8		8	
DVP32HN00R	100 ~ 240V AC	0		32	Relay: 250VAC/30VDC 2A/1point
DVP32HP00R		16		16	
DVP48HP00R		24		24	
DVP32HN00T		0		32	Transistor: 5 ~ 30VDC 0.3A/1 point at 40°C
DVP32HP00T		16		16	
DVP48HP00T		24		24	

Installation

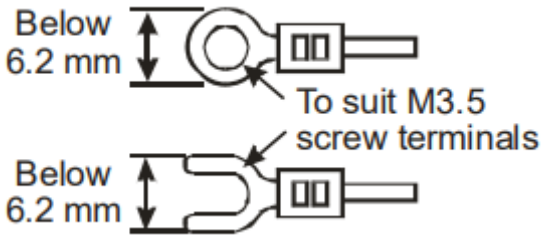


Please install the PLC in an enclosure with sufficient space around it to allow heat dissipation, as shown in the fi gure. • **Direct Mounting:** Please use M4 screw according to the dimension of the product.
• **DIN Rail Mounting:** When mounting the PLC to 35mm DIN
rail, be sure to use the retaining clip to stop any side-to-side movement of the PLC and reduce the chance of wir es being loose. The retaining clip is at the bottom of the PLC. To secure the PLC to DIN rail, pull down the clip, p lace 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, as shown in the figure.



Wiring

1. Use O-type or Y-type terminal. See the figure in the right hand side for its specification. PLC terminal screws should be tightened to 9.50 kg-cm (8.25 i n-lbs) and please use only 60/75ºC copper conductor.	Below 6.2 mm To suit M3.5 screw terminals Below 6.2 mm



2. DO NOT wire empty DO NOT place the input signal cable and output power cable in the same wiring circuit.
3. DO NOT drop tiny metallic conductor into the PLC while screwing and Tear off the sticker on the heat dissipation hole for preventing alien substances from dropping in, to ensure normal heat dissipation of the PLC.

I/O Point Serial Sequence

When connecting MPU with less than 32 points to extension unit, the input number of 1st extension unit is started from X20 in sequence and the output number is started from Y20 in sequence. If connecting MPU with more than 32 points to extension unit, the input number of the 1st extension unit is started from the last inputnumber of the MPU in sequence and the output number is started form the last output number of the MPU in sequence. System application example 1:

PLC	Model	Input points	Output points	Input number	Output number
MPU	16EH/32EH/ 64EH	8/16/32	8/16/32	X0~X7, X0~X17, X0~X37	Y0~Y7, Y0~Y17, Y0~Y37
EXT1	32HP	16	16	X20~X37, X20~X37, X40~X57	Y20~Y37, Y20~Y37, Y40~Y57
EXT2	48HP	24	24	X40~X67, X40~X67, X60~X107	Y40~Y67, Y40~Y67, Y60~Y107
EXT3	08HP	4	4	X70~X73, X70~X73, X110~X113	Y70~Y73, Y70~Y73, Y110~Y113
EXT4	08HN	0	8	–	Y74~Y103, Y74~Y103, Y114~Y123

In system application example, if the input/output of the 1st MPU are less than 16, its input/output will be defined as 16 and thus there are no corresponding input/output for higher numbers. The input/output number of extension number is the sequential number from the last number of the MPU.

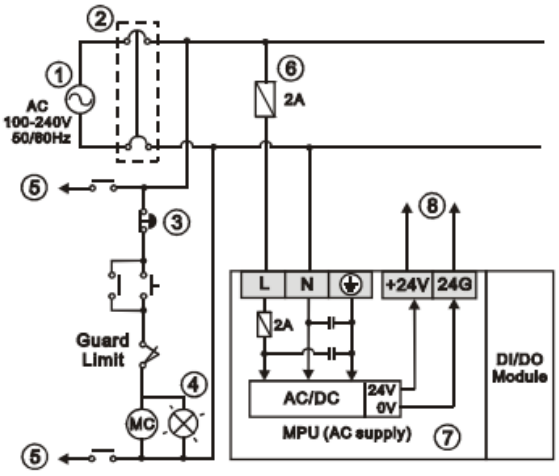
Power Supply

The power input type for DVP-EH2 series is AC input. When operating the PLC, please note the following points:

1. The input voltage should be current and its range should be 100 ~ 240VAC. The power should be connected to L and N Wiring AC110V or AC220V to +24V terminal or input terminal will result in serious damage on the PLC.
2. The AC power input for PLC MPU and I/O modules should be ON or OFF at the same time.
3. Use wires of 1.6mm (or longer) for the grounding of PLC MPU. The power shutdown of less than 10 ms will not affect the operation of the However, power shutdown time that is too long or the drop of power voltage will stop the operation 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. The +24V output is rated at 0.5A from MPU. DO NOT connect other external power supplies to this terminal. Every input terminal requires 6 ~ 7mA to be driven; e.g. the 16-point input will require approximately 100mA. Therefore, +24V terminal cannot give output to the external load that is more than 400mA.

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.



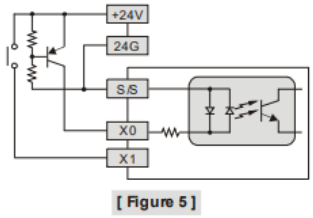
[Figure 4]

○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 plac e.		
○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, 500mA		

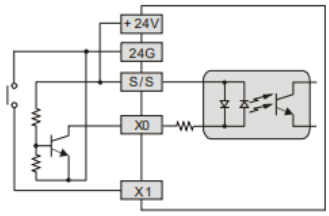
Input Point Wiring

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**
- DC Signal IN – SINK mode



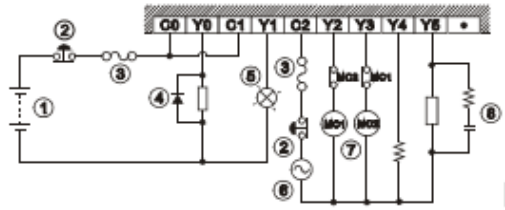
[Figure 5]



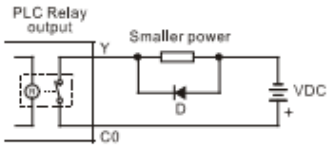
[Figure 6]

Output Point Wiring

Relay (R) output circuit wiring

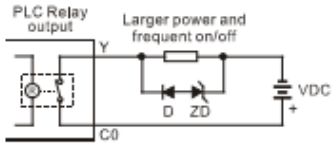


[Figure 7]



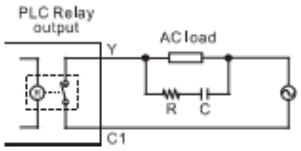
D: 1N4001 diode or equivalent component

[Figure 8]



D: 1N4001 diode or equivalent component
ZD: 9V Zener, 5W

[Figure 9]

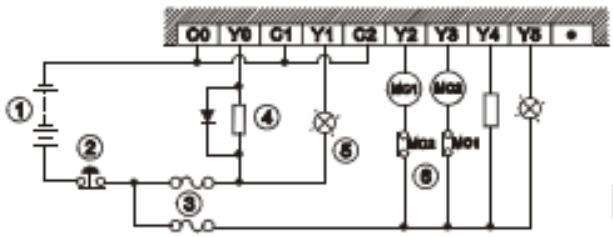


R: 100~120Ω
C: 0.1~0.24uF

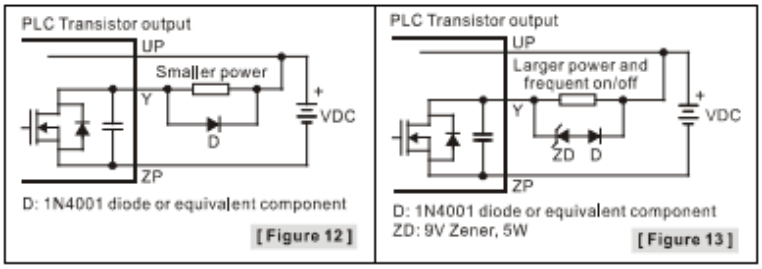
[Figure 10]

○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, Y2 and Y3 control the forward running and reverse running of the motor, forming an interlock for the external circuit, together with the PLC internal program, to ensur e safe protection in case of any unexpected errors.		
○8	Absorber: To reduce the interference on AC load (Figure 10)		

Transistor (T) output circuit wiring

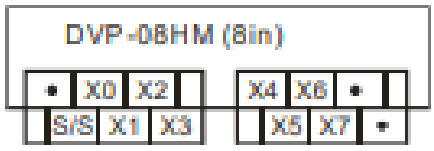
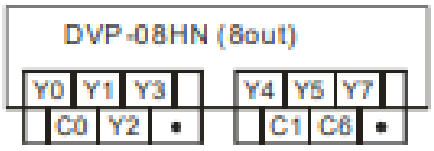
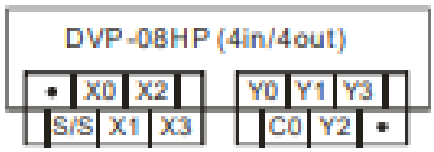
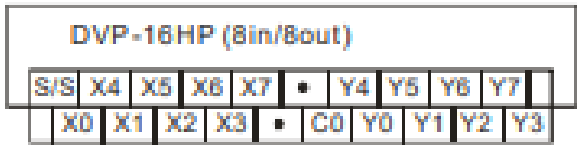
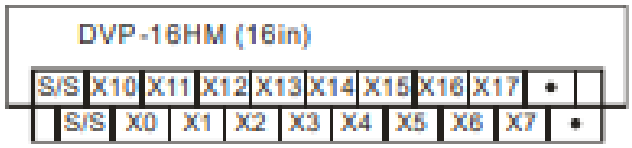
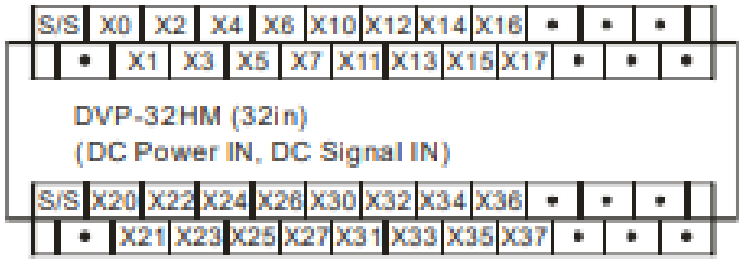
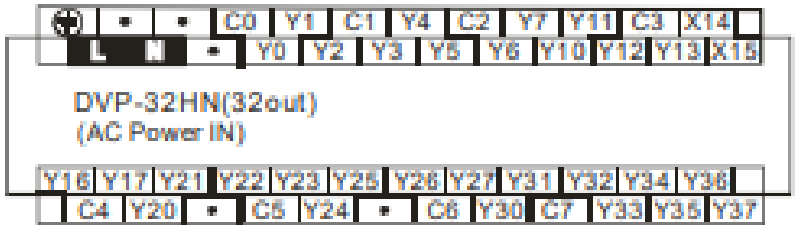


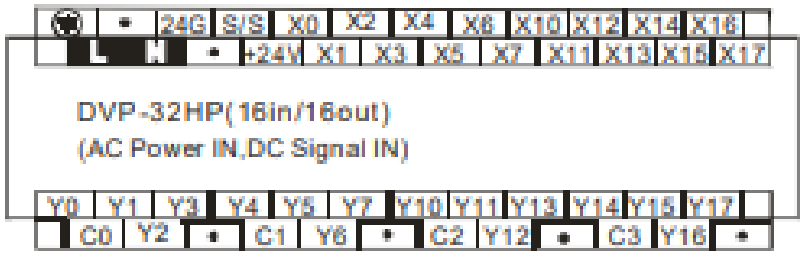
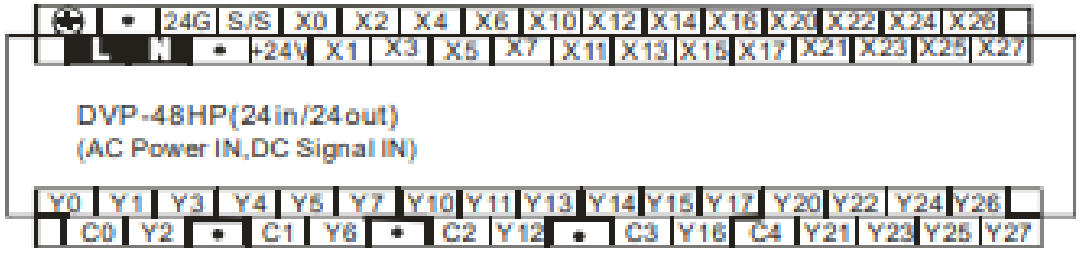
[Figure 11]



○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 bigger than 0.1A 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	Incandescent light (resistive load)				
○6	Manually exclusive output: For example, Y2 and Y3 control the forward running and reverse running of the motor, forming an interlock for the external circuit, together with the PLC internal program, to ensur e safe protection in case of any unexpected errors.				

Terminal Layout

08HM	
08HN	
08HP	
16HP	
16HM	
32HM	
32HN	

32HP	
48HP	

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References

- User Manual