

2017-02-17



5014002902-6P02

# DVP04PT-S

# DVP06PT-S

Instruction Sheet

Bilgi Dökümanı

安 裝 說 明

安 裝 說 明

Temperature Measurement Module

Sıcaklık Ölçüm Modülü

溫度量測模組

溫度量測模块

Thank you for choosing Delta DVP series PLC. DVP04/06PT-S is able to receive 4/6 points of RTDs and convert them into 16-bit digital signals. Besides, through FROM/TO instructions in DVP Slim series MPU program, the data can be read and written. There are many 16-bit control registers (CR) in the modules. The power unit is separate from it and is small in size and easy to install.

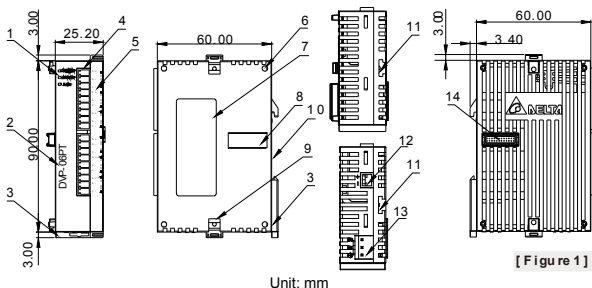
EN ✗ DVP04/06PT-S is an OPEN-TYPE device. It should be installed in a control cabinet free of airborne dust, humidity, electric shock and vibration. To prevent non-maintenance staff from operating DVP04/06PT-S, or to prevent an accident from damaging DVP04/06PT-S, the control cabinet in which DVP04/06PT-S is installed should be equipped with a safeguard. For example, the control cabinet in which DVP04/06PT-S is installed can be unlocked with a special tool or key.

EN ✗ DO NOT connect AC power to any of I/O terminals, otherwise serious damage may occur. Please check all wiring again before DVP04/06PT-S is powered up. After DVP04/06PT-S is disconnected, Do NOT touch any terminals in a minute. Make sure that the ground terminal (⊕) on DVP04/06PT-S is correctly grounded in order to prevent electromagnetic interference.

FR ✗ DVP04/06PT-S est un module OUVERT. Il doit être installé que dans une enceinte protectrice (boîtier, armoire, etc.) saine, dépourvue de poussière, d'humidité, de vibrations et hors d'atteinte des chocs électriques. La protection doit éviter que les personnes non habilitées à la maintenance puissent accéder à l'appareil (par exemple, une clé ou un outil doivent être nécessaire pour ouvrir a protection).

FR ✗ Ne pas appliquer la tension secteur sur les bornes d'entrées/Sorties, ou l'appareil DVP04/06PT-S pourra être endommagé. Merci de vérifier encore une fois le câblage avant la mise sous tension du DVP04/06PT-S. Lors de la déconnection de l'appareil, ne pas toucher les connecteurs dans la minute suivante. Vérifier que la terre est bien reliée au connecteur de terre (⊕) afin d'éviter toute interférence électromagnétique.

## ■ Product Profile & Dimension



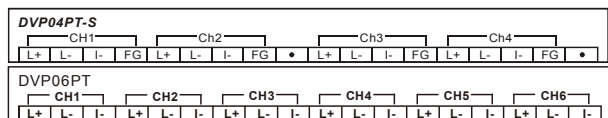
1. Status indicator (POWER, RUN and ERROR)

2. Model name

3. DIN rail clip

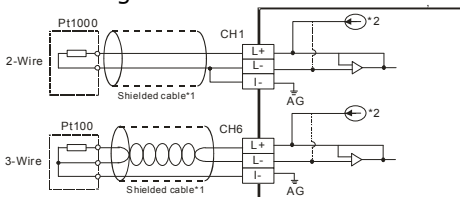
4. I/O terminals	5. I/O point indicator	6. Mounting holes
7. Specification label	8. I/O module connection port	9. I/O module clip
10. DIN rail (35mm)	11. I/O module clip	12. RS-485 communication port (DVP04PT-S)
13. Power connection port (DVP04PT-S)	14. I/O connection port	

## ■ I/O Terminal Layout



[ Figure 2 ]

## ■ External Wiring



**Note1:** Use only the wires that are packed with the temperature sensor for analog input and separate from other power line or any wire that may cause noise.

**Note2:** 3-wire RTD sensor provides a compensation loop that can be used to subtract the wire resistance while 2-wire RTD sensor has no mechanism to compensate.

**Note3:** If there is noise, please connect the shielded cables to the system earth point, and then ground the system earth point or connect it to the distribution box.

**Note4:** Please keep wires as short as possible when connecting the module to a device whose temperature is going to be measured, and keep the power cable used as far away from the cable connected to a load as possible to prevent noise interference.

**Note5:** Please connect Ⓧ on a power supply module and Ⓧ on the temperature module to a system ground, and then ground the system ground or connect the system ground to a distribution box.

## ■ Electrical Specifications

Max. rated power consumption	2W
Operation/storage	Operation: 0°C~55°C (temp.), 5~95% (humidity), pollution degree 2 Storage: -25°C~70°C (temp.), 5~95% (humidity)
Vibration/shock resistance	International standards: IEC61131-2, IEC 68-2-6 (TEST Fc)/ IEC61131-2 & IEC 68-2-27 (TEST Ea)
Series connection to DVP-PLC MPU	The modules are numbered from 0 to 7 automatically by their distance from MPU. No.0 is the closest to MPU and No.7 is the furthest. Maximum 8 modules are allowed to connect to MPU and will not occupy any digital I/O points.

## ■ Functional Specifications

DVP06PT-S	Celsius (°C)	Fahrenheit (°F)
Analog input channel	6 channels per module	
Sensors type	2-wire/3-wire Pt100 / Pt1000 3850 PPM/°C (DIN 43760 JIS C1604-1989) / Ni100 / Ni1000 / LG-Ni1000 / Cu100 / Cu50	
Current excitation	1.53mA / 204.8uA	
Temperature input range	Please refer to the temperature/digital value characteristic curve.	
Digital conversion range	Please refer to the temperature/digital value characteristic curve.	
Resolution	16 bits (0.1°C)	16 bits (0.1°F)

DVP06PT-S	Celsius (°C)	Fahrenheit (°F)
Overall accuracy	±0.6% of full scale during 0 ~ 55°C (32 ~ 131°F)	
Response time	DVP04PT-S: 200ms/channel; DVP06PT-S: 160ms/channel	
Isolation method	Isolation between digital and analog circuitry. There is no isolation between channels. 500VDC between digital circuits and Ground 500VDC between analog circuits and Ground 500VDC between analog circuits and digital circuits 500VDC between 24VDC and Ground	
Digital data format	2's complement of 16-bit	
Average function	Yes (DVP04PT-S: CR#2 ~ CR#5 / DVP06PT-S: CR#2)	
Self diagnostic function	Every channel has the upper/lower limit detection function.	
RS-485 Communication Mode	Yes (DVP04PT-S: CR#32; when connected to CPU PLC, RS-485 communication is not available.	

## ■ Control Register

CR#	Address	Latched	Attribute	Register content	Description								
#0	H'4064	O	R	Model name (Set up by the system)	DVP04PT-S model code= H'8A DVP06PT-S model code = H'CA								
#1	H'4065	X	R/W	CH1~CH4 Mode setting	<table border="1"> <thead> <tr> <th>b15~12</th> <th>b11~8</th> <th>b7~4</th> <th>b3~0</th> </tr> </thead> <tbody> <tr> <td>CH4</td> <td>CH3</td> <td>CH2</td> <td>CH1</td> </tr> </tbody> </table>	b15~12	b11~8	b7~4	b3~0	CH4	CH3	CH2	CH1
					b15~12	b11~8	b7~4	b3~0					
CH4	CH3	CH2	CH1										
Take CH1 mode (b3,b2,b1,b0) for example. 1. (0,0,0,0): Pt100 (default) 2. (0,0,0,1): Ni100 3. (0,0,1,0): Pt1000 4. (0,0,1,1): Ni1000 5. (0,1,0,0): LG-Ni1000 6. (0,1,0,1): Cu100 7. (0,1,0,0): Cu50 8. (1,1,1,1): The channel is disabled.													
#2	H'4066	O	R/W	DVP04PT-S: CH1 average number	Number piece of readings used for the calculation of "average" temperature on CH1. Setting range: K1~K20. Default setting is K10.								
	--			DVP06PT-S: CH1~CH6 average number	Number piece of readings used for the calculation of "average" temperature on CH1 ~ 6. Setting range: K1~K20. Default setting is K10.								
#3	H'4067	O	H'4067	DVP04PT-S: CH2 average number	Number piece of readings used for the calculation of "average" temperature on CH2. Setting range: K1~K20. Default setting is K10.								
#4	H'4068	O	H'4068	DVP04PT-S: CH3 average number	Number piece of readings used for the calculation of "average" temperature on CH3. Setting range: K1~K20. Default setting is K10.								
#5	H'4069	O	H'4069	DVP04PT-S: CH4 average number	Number piece of readings used for the calculation of "average" temperature on CH4. Setting range: K1~K20. Default setting is K10.								
#6	H'406A	X	R	CH1 average degrees	DVP04PT-S:								
#7	H'406B	X	R	CH2 average degrees	Average degrees for CH1 ~ 4								
#8	H'406C	X	R	CH3 average degrees	(Unit: 0.1°C).								
#9	H'406D	X	R	CH4 average degrees	DVP06PT-S:								
#10	--	X	R	CH5 average degrees	Average degrees for CH1 ~ 6								
#11	--	X	R	CH6 average degrees	(Unit: 0.1°C).								
#12	H'4070	X	R	CH1 average degrees	DVP04PT-S:								
#13	H'4071	X	R	CH2 average degrees	Average degrees for CH1 ~ 4								
#14	H'4072	X	R	CH3 average degrees	(Unit: 0.1°F).								
#15	H'4073	X	R	CH4 average degrees	DVP06PT-S:								

CR#	Address	Latched	Attribute	Register content	Description									
#16	--	X	R	CH5 average degrees	Average degrees for CH1 ~ 6 (Unit: 0.1°F).									
#17	--	X	R	CH6 average degrees										
#18	H'4076	X	R	Present temp. of CH1	DVP04PT-S: Present temperature of CH1 ~ 4 (Unit: 0.1°C). DVP06PT-S: Present temperature of channels CH1 ~ 6 (Unit: 0.1°C).									
#19	H'4077	X	R	Present temp. of CH2										
#20	H'4078	X	R	Present temp. of CH3										
#21	H'4079	X	R	Present temp. of CH4										
#22	--	X	R	Present temp. of CH5										
#23	--	X	R	Present temp. of CH6										
#24	H'407C	X	R	Present temp. of CH1	DVP04PT-S: Present temperature of CH1 ~ 4 (Unit: 0.1°F). DVP06PT-S: Present temperature of channels CH1 ~ 6 (Unit: 0.1°F)..									
#25	H'407D	X	R	Present temp. of CH2										
#26	H'407E	X	R	Present temp. of CH3										
#27	H'407F	X	R	Present temp. of CH4										
#28	--	X	R	Present temp. of CH5										
#29	--	X	R	Present temp. of CH6										
#29	H'4081	X	R/W	DVP04PT-S: PID mode setup	Set H'5678 as PID mode and other values as normal mode Default value is H'0000.									
#30	H'4082	X	R	Error status	Data register stores the error status. Refer to the error code chart for details.									
#31	H'4083	O	R/W	DVP04PT-S: Communication address setup	Set up the RS-485 communication address; setting range: 01~254. Default: K1									
	--	X	R/W	DVP06PT-S: CH5~CH6 Mode setting	CH5 mode: b0 ~ b3 CH6 mode: b4 ~ b7 See CR#1 for reference									
32	H'4084	O	R/W	DVP04PT-S: Communication baud rate setting	Communication format: ASCII mode is 7 bits, even bit, 1 stop bit (7, E, 1), while RTU mode is 8 bits, even bit, 1 stop bit (8, E, 1). 6 types of baud rate: b0: 4,800 bps (bit/sec) b1: 9,600 bps (factory setting) b2: 19,200 bps (bit/sec) b3: 38,400 bps (bit/sec) b4: 57,600 bps (bit/sec) b5: 115,200 bps (bit/sec) b6 ~ b13: reserved b14: exchange low and high byte of CRC check code (only for RTU mode) b15: ASCII/RTU selection									
					b15~12	b11~9	b8~6	b5~3	b2~0	ERR LED	reserved	CH6	CH5	If b2~b0 are set to 100, all the setting values of CH5 will be reset to the default settings. To reset CH5 and CH6 to default settings, set b5~b0 to H'24. b12~13 correspond to CH5~6, when bit is ON, the scale exceeds the range, and the Error LED indicator flashes.
#33	H'4085	O	R/W	DVP04PT-S: CH1~CH4 Reset to default setting And Error LED indicator setting	b15~12	b11~9	b8~6	b5~3	b2~0	ERR LED	reserved	CH6	CH5	If b2~b0 are set to 100, all the setting values of CH1 will be reset to the default settings. To reset CH1~4 to default settings, set b11~0 to H'924. b12~15 correspond to CH1~4, when bit is ON, the scale exceeds the range, and the Error LED indicator flashes.
					--	X	R/W	DVP06PT-S: CH1~CH4 Reset to default setting And Error LED indicator setting						

CR#	Address	Latched	Attribute	Register content	Description
#34	H'4086	O	R	Firmware version	Display version in hexadecimal. ex: H'010A = version 1.0A
#35 ~ #48 For system use					
Symbols: O means latched. X means not latched. R means can read data by using FROM instruction or RS-485. W means can write data by using TO instruction or RS-485.					

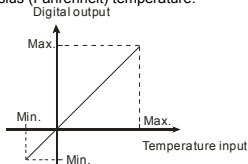
- CR#30 is the error code register.

Note: Each error code will have a corresponding bit and should be converted to 16-bit binary numbers (Bit0~15). Two or more errors may happen at the same time. Refer to the chart below:

Bit number	0	1	2	3
Description	Power source abnormal	The contact is not connected to anything.	Reserved	Reserved
Bit number	4	5	6	7
Description	Hardware malfunction	Reserved	average number error	Instruction error
Bit number	8	9	10	11
Description	CH1 Abnormal conversion	CH2 Abnormal conversion	CH3 Abnormal conversion	CH4 Abnormal conversion
Bit number	12	13	14	15
Description	CH5 Abnormal conversion	CH6 Abnormal conversion	Reserved	Reserved

## ■ Temperature/Digital Value Characteristic Curve

The mode of measuring Celsius (Fahrenheit) temperature:



Platinum resistor	Temperature range		Digital value conversion range	
	°C (Min./Max.)	°F (Min./Max.)	°C (Min./Max.)	°F (Min./Max.)
Pt100	-180 ~ 800°C	-292 ~ 1,472°F	K-1,800 ~ K8,000	K-2,920 ~ K14,720
Ni100	-80 ~ 170°C	-112 ~ 338°F	K-800 ~ K1,700	K-1,120 ~ K3,380
Pt1000	-180 ~ 800°C	-292 ~ 1,472°F	K-1,800 ~ K8,000	K-2,920 ~ K14,720
Ni1000	-80 ~ 170°C	-112 ~ 338°F	K-800 ~ K1,700	K-1,120 ~ K3,380
LG-Ni1000	-60 ~ 200°C	-76 ~ 392°F	K-600 ~ K2,000	K-760 ~ K3,920
Cu100	-50 ~ 150°C	-58 ~ 302°F	K-500 ~ K1,500	K-580 ~ K3,020
Cu50	-50 ~ 150°C	-58 ~ 302°F	K-500 ~ K1,500	K-580 ~ K3,020