FAQ – Field Device

Delta Electronics (Netherlands) B.V.

De Witbogt 20, 5652AG, Eindhoven, the Netherlands

Technical Support contact: iatechnicalsupport@deltaww.com

www.delta-emea.com

Table of Contents

Temperature Controllers: DTA, DTB, DTC

Q   **What is the difference between ON-OFF control and PID control?**

A   When using ON-OFF control, the output is executed by switching ON (full output) and OFF. The output is OFF when the process value reaches the set value, and ON when the process value is lower than the set value. With this method, you always get a small temperature fluctuation.

As for the PID control. The output is controlled by continuous proportional calculation to compensate the changes in the system. When the process value is close to the set value, PID control will adjust the output in small percentage steps to reach a stable temperature. For PID operation, a voltage or current output is required.

Q   **What is the difference between Relay output and Voltage output on the Temperature Controllers?**

A   With PID control, you can set the Control Period parameter. This parameter allows you to set or adjust the time between two ON cycles of the output. A shorter control period provides better control performance. In the case of Relay output, a short control period is not recommended. The switching lifetime of the relay is limiting the switching time. (100,000 times for Relay outputs) To protect the Relay, we recommend to set the control period to 20s or more (with 20s as factory default).

As for the Relay output, the Voltage output allows shorter control period (the factory default is 4s) to achieve accurate control performance. To control high loads, you have to use an SSR (Solid State Relay) for connecting to the Voltage output.
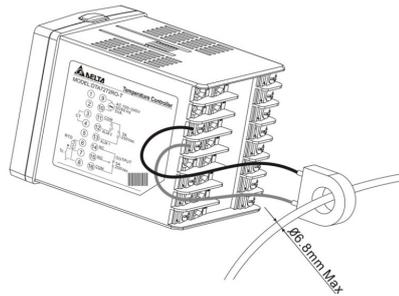
Q   **Which sensing element in the application enables the controller to reach the most accurate and reliable performance?**

A   The controller works accurate in a system of quick temperature transmission, by quickly calculating the output response to the input from the application. For example, an application with liquid, as transmission medium, it is easier to control than the one with air as transmission medium. This is because the liquid temperature is comparatively more stable. Air temperature tends to be unsteady due to the slow transmission speed and external air turbulence.
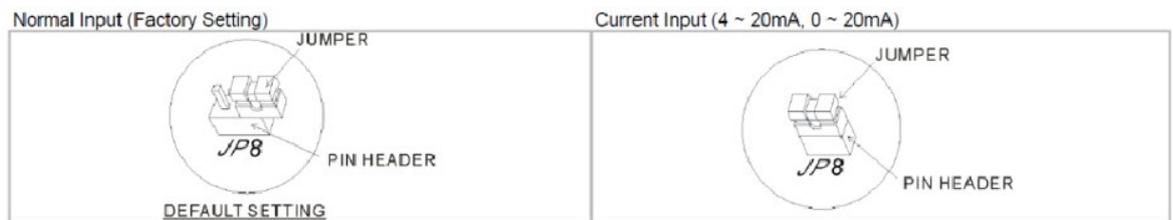
Q   **What is CT (Current Transformer) function used for?**

A   The current in wire will activate the system when the controller performs output. By using the CT function, it is possible to check if the current value is within the allowable range. If the current value is lower or higher than the set value, CT function can be used with alarm output function to warn the users when the current exceeds the set value.

CT wiring method (if CT function is selected)

How to set up current input – remove the temperature controller cover and set JP8 to short. JP8 jumper locates near the sensor input area on PCB board.

Q   **What are the current transformers for DTC?**

A   They are the same as DTB and DT3.

| DT3-CT30A | 30A CT Ring | Max. power wire diameter 7.0mm, max 30A |
| DT3-CT100A | 100A CT Ring | Max. power wire diameter 19.5mm, max 100A |

Timer/Counter/Tachometer: CTA

Q   What are the main functions of Delta CTA?

A   The 3-in-1 timer/counter/tachometer allows you to switch among the functions of timer, counter and tachometer by altering parameters and wiring. The unique mixed mode allows you to enable the functions of timer and counter at the same time.

Q   Does Delta CTA series offer internal power supply for external sensor input?

A   CTA offers DC12V/100mA for the external sensor, such as the encoder, so that users do not have to buy extra power supply for the sensor.

Q   Does Delta CTA offer fast parameter setup?

A   The external DIP switch allow you to alter the parameters by following the instructions in the user's manual. If you choose to use the DIP switch for setting up the parameters, you can only read parts of the functions in the parameter menu.

Q   What type of input signals is accepted by Delta CTA?

A   CTA accepts non-voltage input (NPN) and voltage input (PNP).

Q   What input/output modes does Delta CTA offer in timer function?

A   There are two input modes, UP and DOWN, and 14 output modes for you to select according to the control method you require.

Q   What counter functions does Delta CTA offer?

A   There are five modes available, namely, 1-stage counting, 2-stage counting, batch counting, total counting and dual counting.

Q   What input/output modes does Delta CTA offer in counter function?

A   There are five input modes: UP, DOWN, UD_A (command), UD_B (individual), and

UD_C (quadrature) and 11 output modes to select according to the control methods you require.

Q   What is batch counting?

A   In batch counting, you have to set up two values, the "set value" and "batch set value". When the present value equals the set value, output 2 will be enabled and the batch present value will plus 1. This will repeat until the batch present value reaches batch set value and output 1 is enabled.

Q   What is total counting?

A   There is only one set value in total counting. When the present value equals the set value, output 1 and 2 are enabled at the same time and the present value will be accumulated into the total counter.

Q   How to calculate the pre-scale value of the CTA tachometer?

A   CTA tachometer only accepts a single-phase input signal. Therefore, when CTA is connected to a Delta encoder and one of the phases of the encoder is 2,500ppr, the pre-scale of CTA tachometer can be obtained from the following equations:

$$n = \frac{f}{2500} * 60$$

n = encoder speed in rpm
f = encoder signal frequency in Hz

Example: At f=10kHz, n=(10000/2500)*60=240rpm

The pre-scale value is therefore $\frac{60}{2500} = 0.024$.

In general, the pre-scale factor is $\frac{60}{ppr_{encoder}}$.

Fill in "0.024" in the pre-scale parameter and CTA will synchronously display the encoder rpm.

Q   **How to de-bounce the CTA counter input signal?**

A   De-bounce by using an R-C circuit at the CP1 input. Please see the example below.

     The recommended values: R=100~1kΩ, C=0.01µF

Q   **How to change the setpoints for a speed or frequency output signal?**

A   If you have on the display **Func** (in red) and **Tach** (in green), press **MODE** for long time. Then it shows on lower line in display **SET1** and **TAC**.
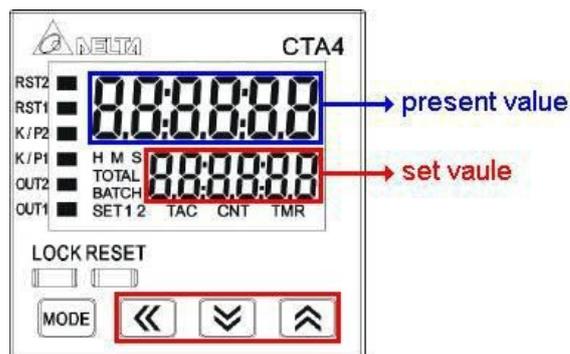
Step 1: Press **<<** and then the value in green starts blinking. With **<<**, **^** and **v** keys you can change its value. Confirm by **MODE**.

Step 2: Press **MODE** again and it changes to **SET 2** and **TAC**.

Step 3: Press **<<** and then the value in green starts blinking. With **<<**, **^** and **v** keys you can change its value. Confirm by **MODE**.

Step 4: Then, long press **MODE** again until you have **Func** (in red) and **Tach** (in green).

*Please refer to the CTA user manual for detailed information.

Digital Pressure Sensor: DPA

Q   **Can Delta pressure sensors DPA measure gas pressure and water pressure?**

A   The DPA sensor currently only supports the measurement of pressure of non-corrosive gasses).

Q   **What is the measuring range of DPA?**

A   DPA01: -100 ~ 100kPa
DPA10: -100 ~ 1,000kPa

Q   **Does DPA support communication functions?**

A   Yes, DPA has also a communication (RS-485) version.

Q   **It is a lot of work to set up parameters one by one. If there are many pressure sensors used at the same time, what can I do?**

A   DPA offers a parameter copy function. You can easily copy parameters from one sensor (master) to another (slave).

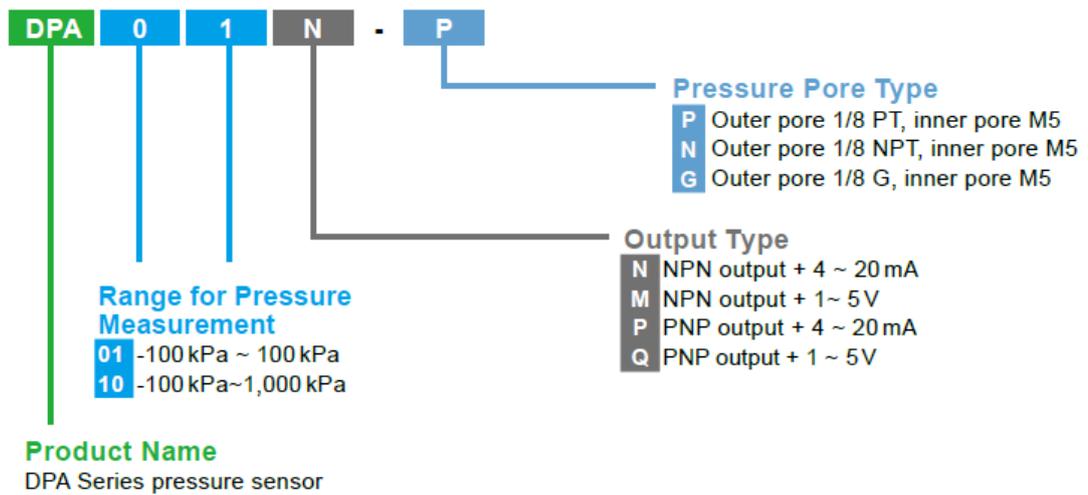**Q**   **What type of Delta DPA pressure sensors are currently available?**

A   Please refer to the table below.

Model Name	Description
DPA01P-P	from -100 to +100 kPa / PNP / 4-20mA / R1/8 PT + inner M5
DPA10P-P	from -100 to +1000 kPa / PNP / 4-20mA / R1/8 PT + inner M5
DPA01Q-P	from -100 to +100 kPa / PNP / 1-5V / R1/8 PT + inner M5
DPA10Q-P	from -1000 to +1000 kPa / PNP / 1-5V / R1/8 PT + inner M5
DPA01N-P	from -100 to +100 kPa / NPN / 4-20mA / R1/8 PT + inner M5
DPA10N-P	from -100 to +1000 kPa / NPN / 4-20mA / R1/8 PT + inner M5
DPA01M-P	from -100 to +100 kPa / NPN / 1-5V / R1/8 PT + inner M5
DPA10M-P	from -100 to +1000 kPa / NPN / 1-5V / R1/8 PT + inner M5
DPA-PFKit	Panel install
DPA-PMKit	Frame install
DPA01NR-P	From -100 to +100 kPa / NPN / 4-20 mA / R1/8 PT + inner M5 & RS-485 comunication

Model Name	Description
DPA10NR-P	From -100 to +1000 kPa / NPN / 4-20 mA / R1/8 PT + inner M5 & RS-485 comunication
DPA01PR-P	From -100 to +100 kPa / PNP / 4-20 mA / R1/8 PT + inner M5 & RS-485 comunication
DPA10PR-P	From -100 to +1000 kPa / PNP / 4-20 mA / R1/8 PT + inner M5 & RS-485 comunication

Q **What is Delta DPA pressure sensor's ordering information (type number)?**

A   Please see detailed information below.

Pressure Pore Type
P Outer pore 1/8 PT, inner pore M5
N Outer pore 1/8 NPT, inner pore M5
G Outer pore 1/8 G, inner pore M5

Output Type
N NPN output + 4 ~ 20 mA
M NPN output + 1~ 5 V
P PNP output + 4 ~ 20 mA
Q PNP output + 1 ~ 5 V

Range for Pressure Measurement
01 -100 kPa ~ 100 kPa
10 -100 kPa~1,000 kPa

Product Name
DPA Series pressure sensor

Photoelectric Sensors

Q   **Which models have a reflector or a mounting bracket in the package?**

A   Only retro-reflective type of sensors have Reflector. Also, only PS-R trimmer type sensors have Mounting Bracket. Please refer to the table below for an overall view. However, mounting brackets and reflectors can be ordered separately.
- Universal mounting bracket: **BK-PSR02**
- Universal reflector, type **RM01**

Part Number	Reflector	Mounting Bracket	Part Number	Reflector	Mounting Bracket
PS-FB1-PDB2	N	N	PS-MR9-US22	N	N
PS-FB1-PLB2	N	N	PS-MR9-US2D	N	N
PS-FL3-PDB2	Y	N	PS-MT5-USB2	N	N
PS-FL3-PLB2	Y	N	PS-MT5-USBD	N	N
PS-FR2-PDB2	N	N	PS-RL4-PS12	Y	Y
PS-FR2-PLB2	N	N	PS-RL4-US22	Y	N
PS-FT3-PDB2	N	N	PS-RL4-US2B	Y	N
PS-FT3-PLB2	N	N	PS-RR3-PS12	N	Y
PS-LL3-USB2	Y	N	PS-RR3-US22	N	N
PS-LR2-USB2	N	N	PS-RR3-US2B	N	N
PS-LT3-USB2	N	N	PS-RR9-PS12	N	Y
PS-ML4-US22	Y	N	PS-RR9-US22	N	N
PS-ML4-US2D	Y	N	PS-RR9-US2B	N	N
PS-MR1-USB2	N	N	PS-RS1-US22	N	N
PS-MR1-USBD	N	N	PS-RS1-US2B	N	N
PS-MR3-NS22	N	N	PS-RT9-PS12	N	Y
PS-MR3-US22	N	N	PS-RT9-USB2	N	N
PS-MR3-US2D	N	N	PS-RT9-USBB	N	N

Power Meters (DPM Series)

Q   **How to set up the communication on DPM-D520I?**

A   There are two modes to set up the communication settings (Modbus) of the DPM-D520I, such as slave ID and Baud Rate.
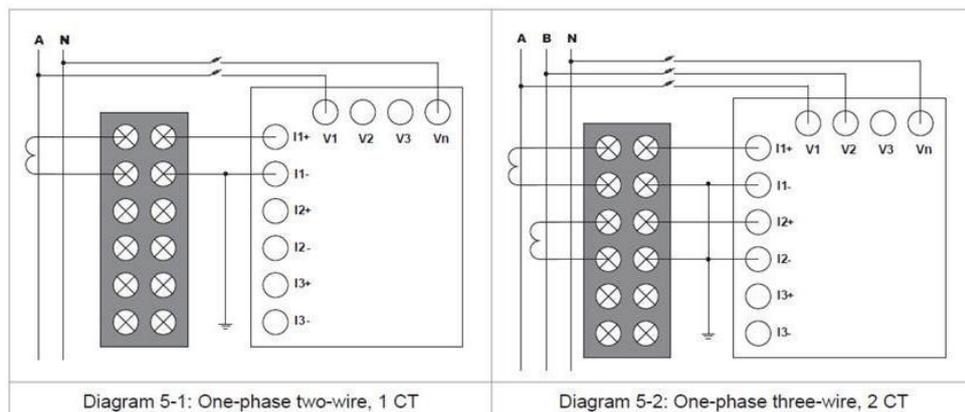

1. **USER mode**: If users know the setting of Modbus, they can communicate with the DPM-520I directly. Or users can set the settings of Modbus directly which they want.

2. **SETUP mode**:
- If users forget the setting of Modbus, users can reset the settings in this mode.
- When switching to SETUP mode, the setting of Modbus will be set to the fixed parameters automatically as Slave ID = 1, Baud Rate = 9600 bps, Data Len = 8 bits, Parity Bit = None and Stop Bit = 1 bit.
- Then, users can set Modbus parameters again.
- When the setting is complete, please switch to USER mode. Then, the setting is done.

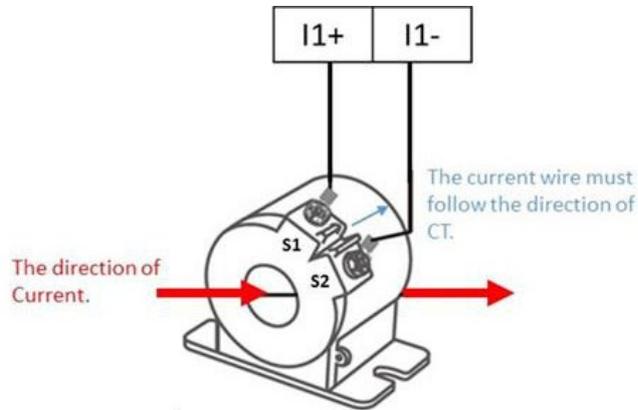**Q**   **Can DPM-D520I be used on 1-phase 2 wire, and 1-phase 3 wire systems?**

A   Yes, it is the same as for the DPM-C530A. Please see the wiring diagram below.

Diagram 5-1: One-phase two-wire, 1 CT   Diagram 5-2: One-phase three-wire, 2 CT

Q   My DPM shows unexpected negative values for power and current. Why?

A   In most cases, this is caused by incorrect wiring and/or current sensor orientation. Please check the followings (for Delta DCT current sensors).

- Make sure the current sensors for L1, L2, L3 are in the right phase.
- Make sure the current sensors are oriented correctly (arrow points to load).

- Make sure S1/S2 are connected to Ix+ and Ix- as indicated.

Q   How does Unlock Function Operation work on DPM-C520?

A   1. Go to the default page 'Home'. Click on 'Back' to switch to option page.
2. Press 'Up' or 'Down' for approximately 5 seconds.
3. Then, you will see 'TIM & DAT' appears on the screen. You can click on 'Next' to change to option.