



Product Solutions Announcement

Delta Industrial Automation Global Solution Center



Product	AMD	Type	VFD-C2000	Security Level	<input checked="" type="checkbox"/> General <input type="checkbox"/> High <input type="checkbox"/> Top
				No.	N/A
Issued by	Global SC	Author	John Zuo	Release Date	19 th July 2012

Point to Point Function in C2000

Devices and tools:

Inverter: VFD007C23A, Firmware V9.020 (12294)

C2000 Optional Card: EMC-PG01U

PM motor: ECMA-C30602ES

Operation Steps:

1. Wiring the power line of ECMA-C3 with C2000 UVW Ports based on Red(U) White(V) Black(W).
2. Set correct parameters 01-00, 01-01 and 01-02 based on PM you are using.
3. Key in the following parameters:

Pr. no	Definition	Setting value
05-33	IM or PM motor choice	1
05-34	PM motor rated current (A)	1.55
05-35	PM motor rated power (kw)	0.20
05-36	PM motor rated speed (rpm)	3000
05-37	PM magnetic roles	10
05-38	PM Inertia (E^{-4} kg-m ²)	0.2

4. Set 05-00=5 for PM motor auto-tuning:

05-33 to 05-37 must be set before PM motor auto-tuning. However, 05-38 has nothing to do with auto-tuning but for automatical bandwidth in ASR.

5. Check the following parameters after PM motor auto-tuning:

05-39 stator resistance, 05-40 PM Ld, 05-41 PM Lq and 05-43 PM Ke

6. Set parameters about encoder:

10-00	Encoder types	2
10-01	Pulse Encoder PPR	2500
10-02	Encoder operation modes	1

7. Set 05-00=4 for PM magnetic angle detecting:

The angle would be set into 05-42 automatically after the magnetic angle detecting. And for ECMA series motor, 05-42 will be 0° or 360° because of the setting in factory. Hence, if the motor is ECMA, we can cancel the magnetic angle detecting but set 05-42=0 directly.

8. Set 00-11=4 for PM FOCPG control mode.

9. Repower the inverter:

Since ECMA use the ABZ encoder, the rotor magnetic information can be obtained only at the power-on time. So after the necessary parameters setting, we should repower inverter and makes PG can obtain the rotor magnetic information in case of fly run based on wrong magnetic information.

10. Set 11-00=2 for inertia auto-tuning:

- Set speed command=2/3*rated speed of PM(05-36).
- Set acceleration and deceleration time is 1.5s or 2s.
- Forward and reverse in turn until 11-01 is stable. (11-01 must be based on 05-38)

11. Set ASR parameters based on the practical situations:

- Please set 11-03 11-04 11-05 if we set 11-00=1 and finish the inertia auto-tuning.
- Please set 11-06 to 11-11 if we set 11-00=0 which doesn't need the inertia auto-tuning.

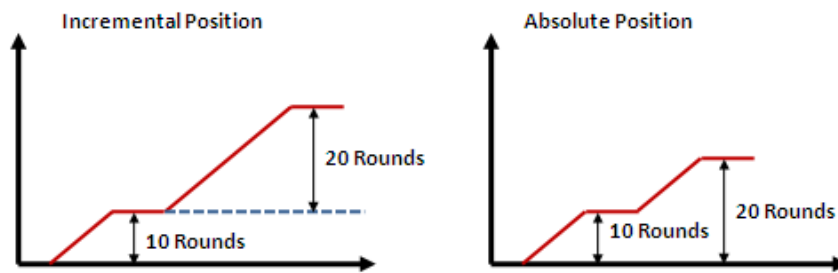
12. Set Pr.00-10 to 1 namely control mode is Point to Point (P2P).

13. Set P2P mode in Pr.00-12

- Set Pr.00-12 to 0, P2P is incremental position.
- Set Pr.00-12 to 1, P2P is absolute position.

E.g. if we run 10 rounds at the first time and give 20 rounds position command again for

running another 20 rounds at the second time, please set Pr.00-12 to incremental position. If we run 10 rounds at the first time and give 20 rounds position command again for running another 10 rounds at the second time, please set Pr.00-12 to absolute position.



14. Set P2P position command from 04-15 to 04-44. Actually, we have 15 groups P2P position commands and every group has two parameters which are rounds and pulses. MIs status can determine which position group you can use. Please refer to as follows:

MI4	MI3	MI2	MI1	Point to Point	
0	0	0	0	0	0
0	0	0	1	NO.1	04-15 for Rounds 04-16 for Pulses
0	0	1	0	NO.2	04-17 for Rounds 04-18 for Pulses
0	0	1	1	NO.3	04-19 for Rounds 04-20 for Pulses
0	1	0	0	NO.4	04-21 for Rounds 04-22 for Pulses
0	1	0	1	NO.5	04-23 for Rounds 04-24 for Pulses
0	1	1	0	NO.6	04-25 for Rounds 04-26 for Pulses
0	1	1	1	NO.7	04-27 for Rounds 04-28 for Pulses
1	0	0	0	NO.8	04-29 for Rounds 04-30 for Pulses
1	0	0	1	NO.9	04-31 for Rounds 04-32 for Pulses
1	0	1	0	NO.10	04-33 for Rounds 04-34 for Pulses
1	0	1	1	NO.11	04-35 for Rounds 04-36 for Pulses
1	1	0	0	NO.12	04-37 for Rounds 04-38 for Pulses
1	1	0	1	NO.13	04-39 for Rounds 04-40 for Pulses
1	1	1	0	NO.14	04-41 for Rounds 04-42 for Pulses
1	1	1	1	NO.15	04-43 for Rounds 04-44 for Pulses

15. Set P2P position speed from 11-43 to 11-45.

- 11-43 is the max frequency during P2P position control.
- 11-44 is the acceleration time for P2P position speed, namely the time from 0 to 11-43.
- 11-45 is the deceleration time for P2P position speed, namely the time from 11-43 to 0.

16. Set Homing Function for P2P.

We should add MI ports for realizing the Homing Function. The related MI definitions as follows:

MI setting	Definition	Remark
44	Negative Limitation	Usually will be warning when MI=44 is ON
45	Positive Limitation	Usually will be warning when MI=45 is ON
46	ORG	Usually for Homing Finish Judgement
47	Homing Enable	When MI=47 is ON, Homing just is enabled

17. Pr00-40 must be set correctly since it is the Homing mode setting parameter.

We strongly suggest you set 00-40=2 or 3 namely ORG as the Homing Finish Judgement, NL and PL will be warning for limitation, Z pulse would be considered.

Please kindly refer to the 00-40 explanation in manual.

18. Setting Homing Speed from Pr00-41 & Pr00-42.

- 00-41 is the max frequency during Homing before getting the position sensor like ORG.
- 00-42 is the max frequency during Homing after getting the position sensor like ORG. When we get the position sensor like ORG, if we still go to look for Z signal, 00-42 will be for this process.

19. Running P2P function.

Attentions:

1. What is the different between 00-10=1 with 00-10=3?

00-10=3 is for P2P mode display when you use PLC inside for Homing Mode. So if you use the Keypad for controlling P2P or Homing Mode, 00-10=1 is OK, please don't use 00-10=3.

Hence, we can regard 00-10=3 as the display only for PLC inside when we use Homing mode, and nothing to do with else.

2. Is MI=47 always on during the Homing Process?

MI=47 must be enabled all the time for Homing Process. If Homing is not finished, we just disable MI=47, the Homing will not be finished even if the ORG sensor is ON.

3. Is the Pulse Record always there?

For Absolute Position, Pulse record is very important. For C2000 current firmware, as long as you keep power on, after going to P2P absolute position, the pulse record will be always there even if you stop or run.

4. How to understand MI all OFF in the P2P?

C2000 current P2P is based on MI variation namely Off to On or On to Off, not by status. E.g., Position 1 is 10 rounds, and MI1=1, so if we make MI1=on, C2000 run 10 rounds, and if we make MI1=OFF, the C2000 will run -10 rounds. So MI all OFF also will run position command and this command is the negative value of the last position command.

This mechanism will influence the homing mode. When we want to use Homing mode, please kindly make MI all off, and then go to homing. If not, when we finish Homing, the pulse record still is not Zero. So please kindly ensure MI all off before we go to Homing.

Hence, P2P in C2000 still has the gap with Servo A2, please kindly follow the mechanism now. P2P in C2000 will be the same as Servo in the future, we will inform in time.

