



# 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	10 <sup>th</sup> April 2012

## PM Testing based on C2000 with Resolver

### Devices and tools:

Inverter: VFD007C23A, Firmware 1.002(11081), PG:EMC-PG01R

PM motor: Magnetic Italy

### Operation Steps:

1. Set 00-02=9 to go back default setting.
2. Set correct parameters 01-00, 01-01 and 01-02 based on PM you are using.
3. Then 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)	Nameplate
05-35	PM motor rated power (kw)	Nameplate
05-36	PM motor rated speed (rpm)	Nameplate
05-37	PM magnetic roles	Nameplate
05-38	PM Inertia ( $E^{-4}$ kg-m <sup>2</sup> )	Nameplate

4. Set 05-00=5 for PM motor auto-tuning (empty load):

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.

**Remark: If motor is IPM, please use 05-00=13 which is for IPM.**

**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	3
10-01	Pulse Encoder PPR	1024
10-02	Encoder operation modes	1
10-30	Resolver Pairs	Nameplate

**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.**

**10. Set frequency to 5HZ, and run. If PG error there, please stop and set 10-02 to 2. And run again, if nothing happen, please stop it.**

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

- Set speed command= $2/3 \times$  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)

**12. 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.

**Attentions:**

- **What Kind of Resolver is matched with PG01R?**

Resolver power input: 7Vrms, 10KHZ.

Resolver signal output: 3.5 $\pm$ 0.175Vrms, 10KHZ. (The ratio is 1:2 between output voltage with input, so the output voltage is 3.5Vrms)

- **What if the Resolver type is not same as the requirements?**

If the Resolver is not the same specification as the requirements:

- Resolver power input: 7Vrms, 10KHZ.
- Resolver signal output: 3.5+-0.175Vrms, 10KHZ.

The two results will come:

- The PM motor can't be driven successfully.
- The PM motor can be driven successfully, but the PG01R warning light will be red always which would cause the PG01R broken.

If the frequency is too large gap with 10KHZ, the LOT light will be red always.

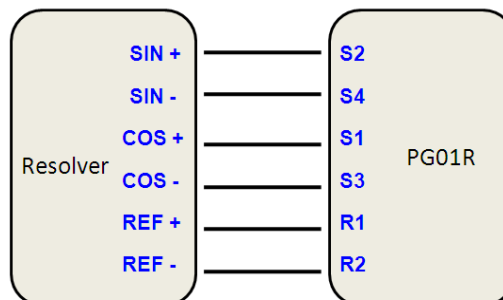
If the ratio is too large gap with 1:2, the DOS light will be red always.

- **Why must we set Pr10-01 Pr10-02 since the encoder is resolver not ABZ pulses?**

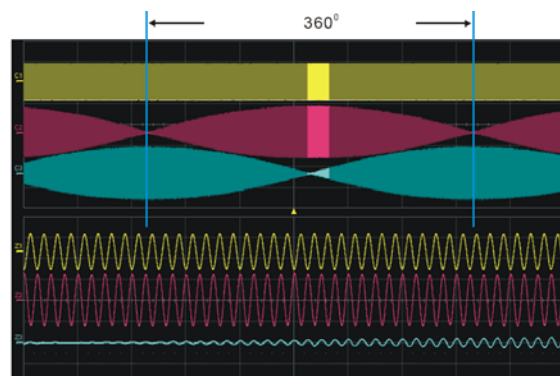
Delta C2000 PG01-R is to receive the resolver signal but MCU of inverter only can receive the pulses signal. Hence, PG01-R have to transform the resolver signal into pulses signal. Besides, Pr10-01 is always 1024 and Pr10-02 is 1 or 2 based on the real resolver you are using.

- **What is the wiring between PG01R with Resolver?**

The wiring can be referred as follows:



If the wiring is OK, the signal scope will be as follows:



The Yellow is R1-R2; The Red is S1-S3; The Blue is S2-S4