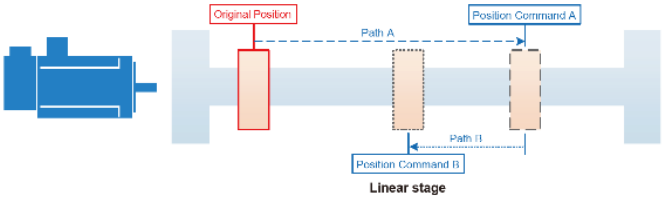
DELTA Newsletter

Industrial Automation Products

Edition 2020-09

Contents

C2000 Improved Positioning and Homing functions



1 News

1.1 ftp-site link

Just to let you know (again), you can find the latest info about our products (manuals, pictures, catalogues, data sheets, application notes, presentations, software, etc.) on our ftp-site.

ftp://den-eindhoven:BuPd2175@ftp2.delta-europe.com/deltronics-eindhoven/customer-service

Name and password are included in the link.
Name: den-eindhoven
Password: BuPd2175

2 Product update

2.1 PHASE OUT – VFD-L series

After 20 years since its release, our VFD-L series of drives will be phased out.
Its recommended replacements are ME300 and VFD-EL series depending on application requirements.

Code	VFD-L2	VFD-L2 description
A	VFD002L11A	Standard
	VFD004L11A	Standard
	VFD002L21A	Standard
	VFD004L21A	Standard
	VFD007L21A	Standard
	VFD015L23A	Standard
B	VFD002L21B	Build-in EMC filter
	VFD004L21B	Build-in EMC filter
	VFD007L21B	Build-in EMC filter
D	VFD004L21D	PNP terminal
	VFD007L21D	PNP terminal
E	VFD004L21E	PNP terminal, build-in EMC filter
	VFD007L21E	PNP terminal, build-in EMC filter

Worldwide Discontinuation	Mar 31st , 2021
Last Purchasing Order	Feb 28th , 2021
Last Shipment	Q2 , 2021

2.2 UPDATE – Firmware of C2000 and CH2000 is updated to V2.06

The new C2000 and CH2000 firmware V2.06 has added many new functions and improvements, too many to be mentioned in this newsletter.

These can all be found in the following files on the ftp-site:
116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06.pdf
116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06_SynRM control mode.pdf
116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06_PMFOC.pdf
116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06_Position control.pdf

Folder: \Customer-Service\Industrial Automation Products\Drive & Power Quality\VFD-C2000\C2000 Presentations&Announcements

Below we will present the more significant parts.

Corrections:

No.	v2.05 problems	v2.06
1	IMFOC control mode and operating at rated frequency or Flux Weakening Area, a current glitch will occur easy and resulting over current fault.	Optimize IMFOC control to solve current glitch problem
2	Mechanical vibration due to insufficient of the IMFOC current loop bandwidth	Optimize the current loop bandwidth design method to solve the problem of insufficient bandwidth
3	The error between the DCBUS ripple calculation result and the actual value is too large (calculation result is less than the actual value). This will resulting in incorrect action level for phase-loss protection.	The result of the DCBUS ripple calculation is correct, and the phase-loss protection can be normal.
4	The Pr10-05 and 10-07 are motor side mechanical gear and the keyapd display as load side mechanical gear.	10-05 & 10-7 display as Motor side mechanical gear.

Modifications:

1. The position control and homing function have been completely rebuilt. You can read all the changes in the document titled 116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06_Position control.pdf from the ftp-site.

2. CANOpen “error detect” communication packet is no longer bound to SYNC signal.

3. Modified M1005 definition
   M1005: Drive Alarm→Drive fault indication. Add M1019: Drive Warning indication.

	V2.05	V2.06
M1005	Drive Alarm(Include Error and warning)	Drive Fault
M1019	No	Drive Warning

4. Energy-saving function was modified

V2.05			V2.06		
07-21	Automatic Energy-saving Selection	0 : Disable 1 : Enable	07-21	Automatic Energy-saving (AES) Selection	0 : Disable 1 : Power factor energy-saving improvement 2 : Automatic energy-saving optimization
07-22	Energy-saving Gain		07-41	Minimum Frequency for AES	0~40.00 Hz
			07-42	Delay Time for AES	0~600
			07-43	Targeted Power Factor Angle for AES	0.00~65.00
			07-44	Maximum Voltage Drop for AES	0~70%
			07-45	AES Coefficient	0~10000%
1	Because entering energy-saving conditions is not easy to lead to the inability to carry out continuous energy-saving operations, and this resulting in poor efficiency.		2	The optimized energy-saving function can continuously saves energy operation and increases energy saving efficiency.	

↗	07-21	Automatic Energy-saving (AES) Selection						
								Default: 0
		Settings	0: Disabled					
			1: Power factor energy-saving improvement (for VF, SVC, VFPG control modes)					
			2: Automatic energy-saving optimization (for VF, SVC, VFPG control modes)					

You can read all the details about the changes to the energy saving function in the document titled 116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06.pdf from the ftp-site.

5. Notch Filter function has been modified:

V2.05			V2.06		
11-15	Notch Filter Depth	0~20db	11-15	Notch Filter Depth	0~100 dB
11-16	Notch Filter Frequency	0.00~200.00Hz	11-16	Notch Filter Frequency	0.0~6000.0 Hz
			11-47	Notch Filter Bandwidth	0~1000 Hz
1	The lower the carrier frequency and the higher filter frequency has worse performance.		1	Huge improve Notch filter efficiency at high frequencies.	
2	The bandwidth is a fixed value, this resulting the lower the filtering frequency, the worse the filtering efficiency.		2	The new version has bandwidth settings. Appropriate bandwidth setting can has significantly improve Notch filter low-frequency filtering performance.	

More details can be found in file 116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06.pdf from the ftp-site.

6. Pr06-03, 06-04 and 06-12 setting range has been modified
VF mode: only refers to Pr06-03/06-04 and is no longer linked to Pr06-12 and Pr11-17~11-20.
FOC mode: will refer to Pr06-03/06-04, 06-12 and 11-17~11-20 as stall and current limit.

	Pr06-03/06-04		Pr06-12	
	Max	Default	Max	Default
V2.05	160	120	250	170
V2.06	175	120	175	170

7. Carrier frequency upper limit has been modified

	00-17	Carrier Frequency					
							Default: Table below
		Settings	2–15kHz				

Normal duty						
	VF, VFPG, SVC			IMFOCPG, IMTQCPG		
	Min	Default	Max	Min	Default	Max
VFD007~150C43A/E VFD007~110C23A/E	2kHz	8kHz	15kHz	2kHz	8kHz	10kHz
VFD185~550C43A/E VFD150~370C23A/E	2kHz	6kHz	10kHz	2kHz	6kHz	10kHz
VFD750~4500C43A/E VFD450~900C23A/E	2kHz	4kHz	9kHz	2kHz	4kHz	9kHz

Normal duty						
	PMFOCPG, PMTQCPG			PMFOC, IPMFOC		
	Min	Default	Max	Min	Default	Max
VFD007~150C43A/E VFD007~110C23A/E	4kHz	8kHz	10kHz	4kHz	8kHz	10kHz
VFD185~550C43A/E VFD150~370C23A/E	4kHz	6kHz	10kHz	4kHz	6kHz	10kHz
VFD750~4500C43A/E VFD450~900C23A/E	4kHz	4kHz	9kHz	4kHz	4kHz	9kHz

Normal duty						
	IMFOC, IMTQC			SRMFOC		
	Min	Default	Max	Min	Default	Max
VFD007~150C43A/E VFD007~110C23A/E	4kHz	8kHz	12kHz	2kHz	4kHz	8kHz
VFD185~550C43A/E VFD150~370C23A/E	4kHz	6kHz	10kHz	2kHz	4kHz	8kHz
VFD750~4500C43A/E VFD450~900C23A/E	4kHz	4kHz	9kHz	2kHz	4kHz	8kHz

Heavy duty						
	VF, VFPG, SVC			IMFOCPG, IMTQCPG		
	Min	Default	Max	Min	Default	Max
VFD007~150C43A/E VFD007~110C23A/E	2kHz	2kHz	15kHz	2kHz	2kHz	10kHz
VFD185~550C43A/E VFD150~370C23A/E	2kHz	2kHz	10kHz	2kHz	2kHz	10kHz
VFD750~4500C43A/E VFD450~900C23A/E	2kHz	2kHz	9kHz	2kHz	2kHz	9kHz

Heavy duty						
	PMFOCPG, PMTQCPG			PMFOC, IPMFOC		
	Min	Default	Max	Min	Default	Max
VFD007~150C43A/E VFD007~110C23A/E	4kHz	4kHz	10kHz	4kHz	4kHz	10kHz
VFD185~550C43A/E VFD150~370C23A/E	4kHz	4kHz	10kHz	4kHz	4kHz	10kHz
VFD750~4500C43A/E VFD450~900C23A/E	4kHz	4kHz	9kHz	4kHz	4kHz	9kHz

Heavy duty						
	IMFOC, IMTQC			SRMFOC		
	Min	Default	Max	Min	Default	Max
VFD007~150C43A/E VFD007~110C23A/E	4kHz	4kHz	12kHz	2kHz	4kHz	8kHz
VFD185~550C43A/E VFD150~370C23A/E	4kHz	4kHz	10kHz	2kHz	4kHz	8kHz
VFD750~4500C43A/E VFD450~900C23A/E	4kHz	4kHz	9kHz	2kHz	4kHz	8kHz

8. Pr08-15 PID Feedback Filter Time has become a “Reserved” parameter

9. Communication card CMC-EIP01 function optimization
   WPLsoft monitor PLC status through the communication card, thus, between the communication card and drive, the transmission of the SPI uses the new transmission packet (Header+MODBUS).

New functions:

1. SynRM FOC control mode (pr00-11=8)

	00-11	Control of Speed Mode	
			Default: 0
		Settings	0：VF (IM V/f control)
			1：VFPG (IM V/f control+ Encoder)
			2：SVC(IM sensorless vector control)
			3：FOCPG (IM FOC vector control+ encoder)
			4：FOCPG（PM FOC vector control + Encoder）
			5：FOC Sensorless (IM field oriented sensorless vector control)
			6：PM Sensorless (SPM field oriented sensorless vector control)
			7：IPM Sensorless (IPM field oriented sensorless vector control)
			8：SynRM Sensorless (SynRM field oriented sensorless vector control)

   More details and information on how to set up a Synchronous Reluctance Motor together with the C2000 can be found in file 116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06_SynRM control mode.pdf from the ftp-site

2. New parameter 09-49: CAN extend setting

	09-49	CAN Extend setting	
		Settings	Bit0: Index 604F and 6050 will go to update 1st acceleration/deceleration time Bit0=0: going to update 1st acc/dec time(default setting bit0=0) Bit0=1: not going to update Bit1: CANOpen Identification code verification is distinguished by power module or drive series Bit1=0: distinguished by power module Bit1=1: distinguished by drive series

3. CANopen 3000h~3063h communication addresses added. These correspond to built-in PLC D900~D999 Data Registers and support PDO SDP read

4. New function: Random PWM (RPWM)
   The RPWM function changes the motors audible noise

	00-33	RPWM Mode Selection	
			Default: 0
		Settings	0: Disabled 1: RPWM mode 1 2: RPWM mode 2 3: RPWM mode 3

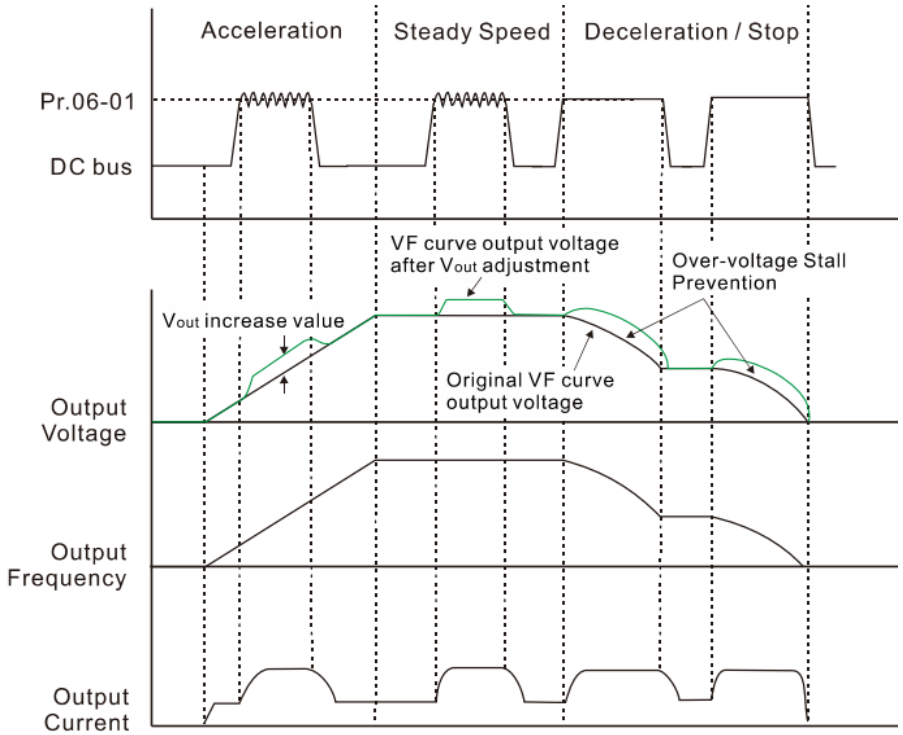
↗	00-34	RPWM Range						
								Default: 2.0 kHz
		Settings	0.0–4.0 kHz					

More information and setup examples can be found in file 116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06.pdf from the ftp-site.

5. Pr01-49 added a new selection: "*3: Electromagnetic energy traction control*"

↗	01-49	Deceleration Method Selection						
								Default: 0
		Settings	0: Normal deceleration					
			1: Over-voltage energy restriction					
			2: Traction energy control (TEC)					
			3: Electromagnetic energy traction control					

↗	01-50	Electromagnetic Traction Energy Consumption Coefficient						
								Default: 0.50
		Settings	0.00–5.00					



More details can be found in file 116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06.pdf from the ftp-site.

6. New selection options for the Multi-function Outputs

Setting	Function	Description
75	Forward running status	MO=75 activates (ON) when the drive runs in forward. MO=76 activates (ON) when the drive runs in reverse. When the drive is in stop status, MO=75 and MO=76 deactivates (OFF).
76	Reverse running status	

	Multi-function output (MO) terminal =25 Forward command	Multi-function output (MO) terminal =26 Reverse command	Multi-function output (MO) terminal =75 Forward running status	Multi-function output (MO) terminal =76 Reverse running status
Drive runs in FWD	ON	OFF	ON	OFF
Drive runs in REV	OFF	ON	OFF	ON
Drive stops	The drive runs in forward and stops. The "FWD" light on the panel is in a steady ON status, and MO=25 remains ON.	The drive runs in reverse and stops. The "REV" light on the panel is in a steady ON status, and MO=26 remains ON.	OFF	OFF
	When the drive is in stop status, either MO=25 or MO=26 activates (ON).		When the drive is in stop status, both MO=75 and MO=76 deactivate (OFF).	

7. New parameter 00-37 Over-modulation Gain

00-37	Over-modulation Gain	
		Default: 100
	Settings	80–120

The drives maximum output voltage is limited by the supply voltage. This parameter allows the drive to go into over-modulation. For example, if pr00-37=110 and the supply voltage is 400V the maximum voltage that the drive will be able to output is 440V.
Be aware that low-frequency harmonics can occur if the gain is too large.

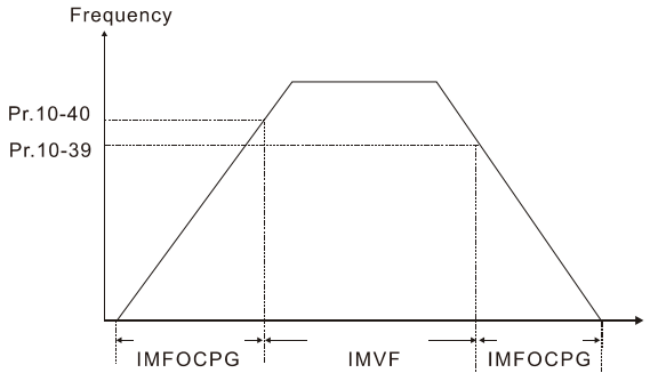
8. Online modification of built-in PLC program and monitoring program functions through EIP01 communication card

9. New function: Switch from IMFOCPG control mode to VF control at high speeds
PG Encoder cards have a maximum input frequency that they can read. This can be 30kHz, 300kHz or 600kHz. In some cases, when using an encoder with a very high ppr count and a motor with a very high operating speed (e.g. spindles) it is very easy to exceed this maximum input frequency. This means that above certain frequencies the PG card will no longer be able to read the encoder pulses and will trip the drive. This function will avoid a drive fault at high speeds by switching the drive from IMFOCPG mode to VF mode so the encoder pulses are no longer needed.

	11-00	System Control	
			Default: 0000h
		Settings	bit0: Adjust ASR and APR automatically or manually
			bit1: Inertia estimation (only for FOCPG control mode)
			bit2: Zero-speed servo
			bit6: 0 Hz linear-cross
			bit7: Saving or not saving the frequency
			bit8: Maximum speed for point-to-point position control
			bit11: Switch between IMFOCPG and IMVF modes (see Pr.10-39 and Pr.10-40)

✓	10-39	Frequency to Switch from I/F Mode to PM Sensorless Mode / Frequency to Switch from IMVF Mode to IMFOCPG Mode When Pr.11-00 bit11=1 in IMFOCPG Mode
		Default: 20.00/20.00

↗	10-40	Frequency to Switch from PM Sensorless Mode to I/F Mode / Frequency to Switch from IMFOCPG Mode to IMVF Mode When Pr.11-00 bit11=1 in IMFOCPG Mode							
									Default: 20.00/40.00
		Settings	0.00–599.00 Hz / 30.00–599.00 Hz						



More information and setup examples can be found in file 116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06.pdf from the ftp-site.

10. Added new Warning and Error codes related to the new Positioning and Homing functions

Warning codes:
125 Index Pule fail(INDX)
126 Homing not completed(nHoY)
127 Hardware Positive limit warning(HPL)
128 Hardware Negative limit warning(HnL)
129 Software Positive limit warning(SPL)
130 Software Negative limit warning(SnL)
131 Position counter overflow(PoF)
132 Homing procedure fail(HPF)
133 Position error too large(oPE)

Error codes:
92 Pulse tuning Inductance error(LEr)
171 Position control error too large(oPEE)

You can find more information about the new P2P function in the document titled 116A-FE-xxC-20730-E-01-01_C2000 firmware v2.05 update to v2.06_Position control.pdf from the ftp-site.

New accessories:

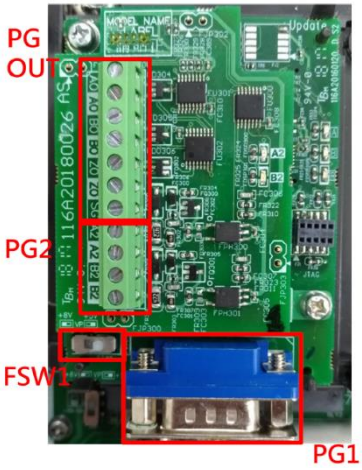
1. Firmware V2.06 supports the new PG card: EMC-PG01H for SinCos encoders. For more information see the following sub-chapter.

Release:

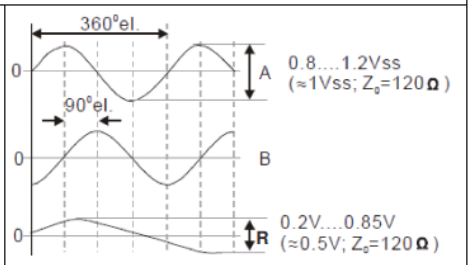
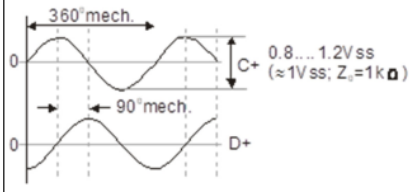
Firmware Version	Switching Period	
V2.06	Taoyuan	T2031
V2.06	Wujiang	W2031

2.3 NEW – EMC-PG01H Encoder card for SinCos encoders

The new EMC-PG01H card has been released in EMEA.
It is supported by the C2000 and CH2000 starting with firmware version 2.06.

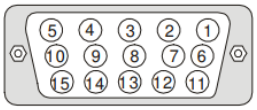


Speciffications:

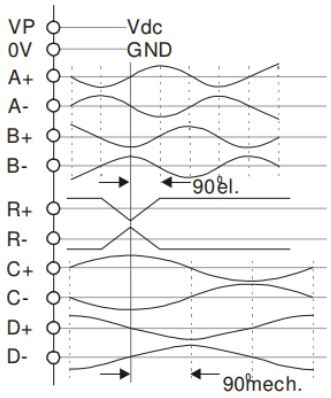
Terminals		Descriptions	
PG1	VP	Output voltage for power: +5V/+8V ±5% (use FSW1 to switch +5V/+8V) Max. output current: 200mA	
	DCM	Common for power and signal	
	A+ · A- · B+ · B- · R+ · R-	Encoder input signal(Incremental signal) Max. input frequency:600kHz	
	C+ · C- · D+ · D- ·	Encoder input signal(Absolute signal)	
PG2	A2 · /A2 · B2 · /B2	Encoder input signal (Line Driver or Open Collector) Open Collector input voltage: +5V~+24V(Note 1) It can be 1-phase or 2-phase input. Max. input frequency: 300kHz	
PG OUT	AO · /AO · BO · /BO · ZO · /ZO · SG	PG Card Output signals. It has division frequency function: 1–255 times Max. output voltage for Line driver: $5V_{DC}$ Max. output current: 50mA Max. output frequency: 600kHz SG is the GND of PG card. It is also the GND of position machine or PLC to make the output signal to be the common pivot point.	

Note 1: Open Collector application, input current 5–15mA to each set then each set needs one pull-up resistor. If input voltage of open collector is 24V, the power of encoder needs to be connected externally.

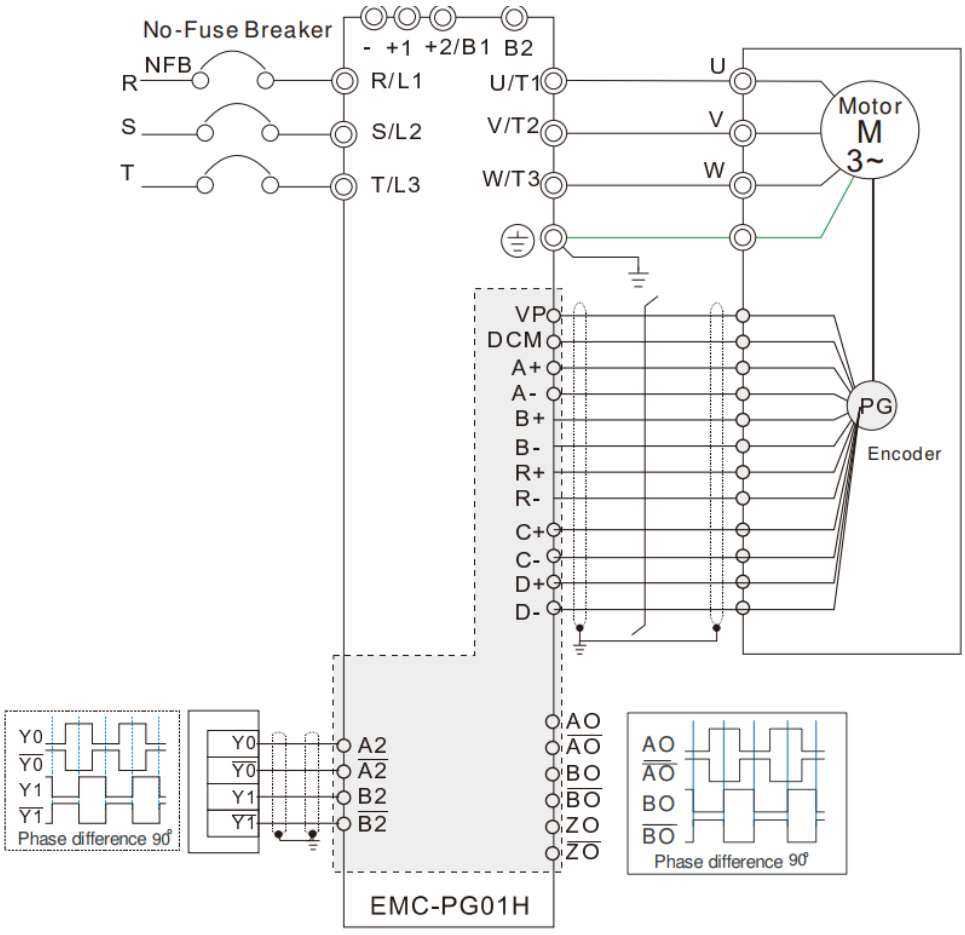
PG1 Terminal description:



No	Terminal
1	B-
2	NC
3	R+
4	R-
5	A+
6	A-
7	DCM
8	B+
9	VP
10	C+
11	C-
12	D+
13	D-
14	NC
15	NC



Wiring Diagram:



Related Parameters:

10-00	Encoder Type Selection	
		Default: 0
	Settings	0: Disabled
		1: ABZ
		2: ABZ (Delta encoder for Delta Servo motor)
		3: Resolver
		4: ABZ/UVW
		5: MI8 single phase pulse input
		6 : Sincos Incremental signal type(signal : A/B、C/D、R)
		7 : Sincos Absolute signal type(signal : A/B、R)

10-47	PG1 Signal Interpolation Magnification	
		Default: 0
	Settings	0: x1 1: x2 2: x4 3: x8 4: x16 5: x32 6: x64

- Valid only when Pr.10-00=6 or 7.
- Use Pr.10-47 to set interpolation magnification of the PG1 Sin/Cos signal. After the interpolation is finished, the encoder PPR (Pulses per Revolution) = Pr.10-01 x $2^{Pr.10-47}$. The larger the interpolation magnification, the more accurate the positioning.
- Example:
  When Pr.10-01=128 and Pr.10-47=0, PPR= 128 x 2^0 x 4 (four-time frequency) = 1024.
  When Pr.10-01=128 and Pr.10-47=3, PPR= 128 x 2^3 x 4 (four-time frequency) = 8192.

2.4 UPDATE – Firmware of VFD-ED is updated from V1.07 to V1.09

Corrections:

No.	V1.07 problems	V1.08
1	Elevator starting (zero speed control)、running and stop、have low frequency noise. Drives competing in the same field haven't noise	Set the parameter when the current error is small (steady state), reduce the proportional control amount to avoid voltage fluctuations to produce current ripples
2	Using L-shaped car frame, when the elevator start will shake	Modify Dwell time at starting have Scurve function
3	Detection mechanism When the reset time is less than 5 seconds, GFF and Ocx will be fixed at 5 seconds, when it is longer than 5 seconds, the reset action will be performed according to the error reset time	Fix GFF and Ocx error reset
4	When "TH1 Open" error occurs, display "tho1" does not match the manual	Modify the display as "th1o"
5	When Pr.00-10 set to m/s, still display Hz	Fix the unit conversion abnormality of Pr.00-10

No.	V1.08 problems	V1.09
1	When parameter 00-10=0, if the acceleration/deceleration value is changed, adjusting parameters 11-01 ~ 11-05 will make the acceleration/deceleration be reset to zero.	Fixed

Modifications:

Change the decimal point of the software version number to conform the Delta format.

00-06 Software Version

Control Mode VF VFPG SVC FOCPG FOCPM Default : ##.##

Settings Read Only

The original software version display as 1.090 changed to 1.09.

Improve the EPS speed, · modify safety factor 0.25 -> 0.5.

06-48 Power Capacity of Emergency Power (EPS)

Control Mode VF VFPG SVC FOCPG TQCPG FOCPM Default : 0.0

Settings 0.0~100.0 kVA

When using emergency power (EPS), you must set the parameter to the required power capacity for the emergency power, and then the AC motor drive calculates the acceptable elevator speed (Pr.06-44) with the following equation.

I_{motor_rated} = 05 – 01 (Induction Motor) / 08 – 01 (PM Motor)

$$V_{eps\_max} = \frac{06-48 \times 0.5}{\sqrt{3} \times I_{motor\_rated}}$$

Modify safety factor

$$f_{eps\_limit} = \frac{V_{eps\_max}}{01-02} \times 01-01 \times 0.5 \Rightarrow f_{eps\_limit} = \frac{V_{eps\_max}}{01-02} \times 01-01$$

When the Frequency command > fEPS, the operation speed of emergency power (EPS) is fEPS.

When the Frequency command ≤ fEPS, the operation speed of emergency power (EPS) is set according to the current Frequency command.

New functions:

1. Added Load Compensation Auto-tuning.

03-15 Load Compensation Auto-tuning

Control Mode VF VFPG SVC FOCPG TQCPG FOCPM Default: 0

Settings 0: No function

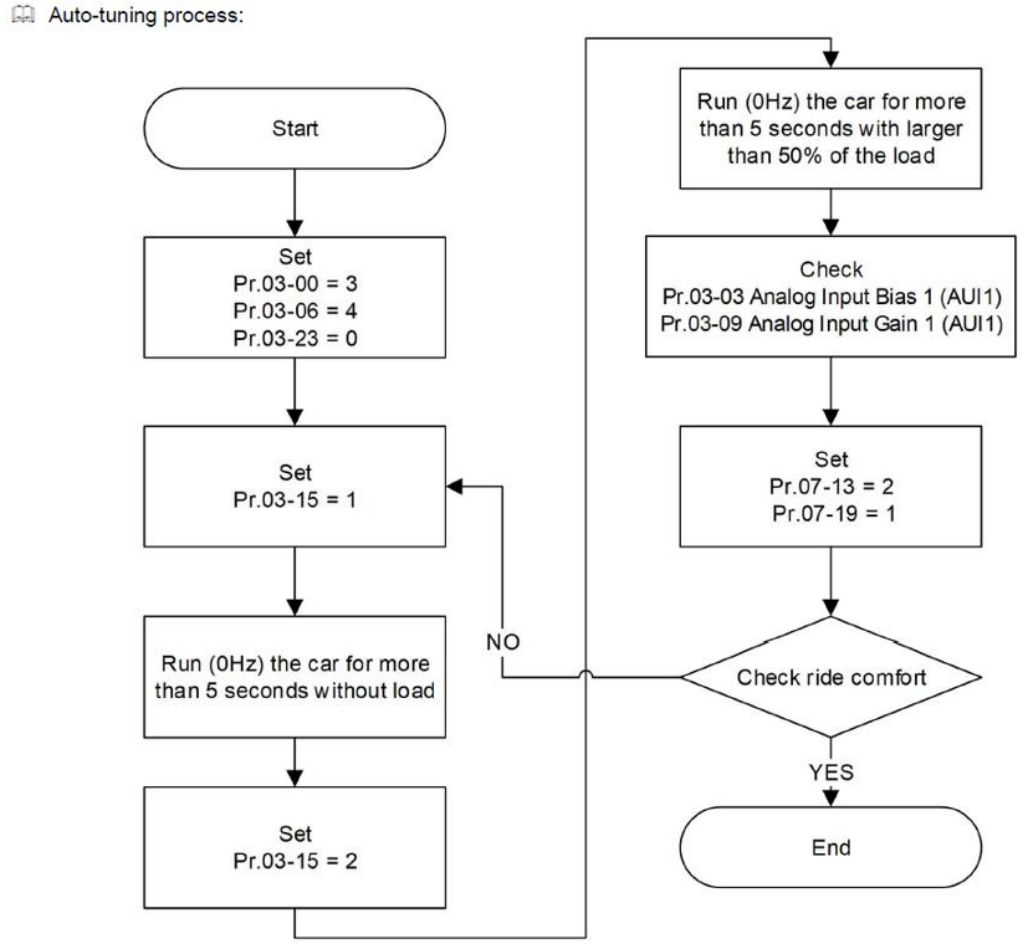
1: Auto-tunes with running without load

2: Auto-tunes with running with load

Use torque compensation function to avoid the Roll-back generated by using IM to work with spiral gear.

This function is only valid for AUI1.

Auto-tuning process:



2. Added Turkish and Russian languages.

3. Added direct docking support to 64 floors, v1.07 only has 50 floors.

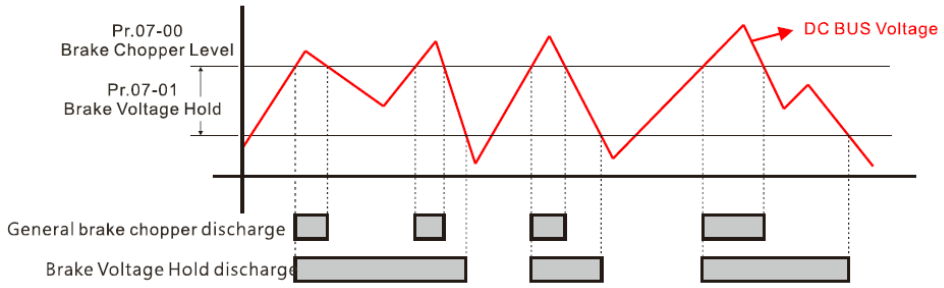
4. Added Brake Transistor Hysteresis Voltage

07-01 Brake Transistor Hysteresis Voltage

Control Mode VF VFPG SVC FOCPG TQCPG FOCPM Default : 0.0

Settings 0.0~100.0 V

Used with Pr.07-00 to make the activated voltage level within range in order to prevent the brake resistor from overheating due to frequent ON/OFF of the brake transistor caused by fluctuated DC bus voltage.



Release:

Firmware Version	*Estimated Switching Period	
v1.09	Taoyuan	T2041
v1.09	Wujiang	W2041

*Delta reserves the right to make changes to the switching period and will notify you once confirmed.

2.5 UPDATE – Firmware of KPC-CC01 / CE01 is updated from V1.42 to V1.43

Corrections:

No.	V1.42 problems	V1.43
1	The communication between Keypad and Inverter (ED-S/IED-S/DD) is abnormal, so that Keypad cannot access Inverter information.	The communication between Keypad and Inverter (ED-S/IED-S/DD) is normal.

Release:

Firmware Version	Switching Period	
V1.43	Taoyuan	NA
V1.43	Wujiang	W2029

2.6 UPDATE – DVP-SA2 & SX2 Series PLC firmware updated to V3.00

Series	Models	Firmware Version	Release Date
DVP-SA2 DVP-SX2	DVP12SA211T DVP12SA211R DVP20SX211T DVP20SX211R DVP20SX211S	V2.88→ V3.00	20200904 (W2036)

Changes:

1	ASDRW	Changed the maximum written length per communication from 10 to 8 WORDs to match the data length limit of Delta ASDA servo drive.
2	High-speed counters C247, C248	Fixed an issue that after C247 or C248 is enabled, you cannot change the counting value.
		When using DHSZ instruction with C247 or C248, it is possible the differential output may not be right.
3	DPLSV	Fixed an issue that when using DPLSV instruction to change the output pulse, the maximum output pulse is not limited to 100 KHz.
4	Communication with DOP100 (V4.00.06.47)	Fixed an issue that DOP100 writes an out of range value in D1038, whenever it is connected to PLC and supplied with power. Once PLC executes D1038 by accident, the communication stops. Solution: Only values within allowable range can be written in D1038.
5	LDZ	Fixed an issue that even after executing LDZ instruction and successfully compiling the program, once downloading the program to PLC, it responses with a syntax error.
6	Positioning instructions and the deceleration to stop function	Fixed an issue that when using the positioning instructions with M1108/M1110 flags to decelerate and then stop, during execution, the positioning instruction might be stopped once it is started and that leads to abnormal output.

New instructions and functions:

The following instructions and functions should work with ISPSoft V3.09 or WPLSoft V2.48 or later versions.

No.	API No.	Functions / Instructions	Descriptions
1	66	DTM	Added two new functional parameters. K30: to swap bit data K39: to read the PLC serial number
2	--	AIO module – Data mapping area	Added three new modules DVP04AD-S2, 04DA-S2, 06XA-S2 that can perform data mapping automatically.
3	--	Marking alignment	DDRVI and PLSR instructions now can work with the mask value -1, -2 and -3 for the setting of the corresponding masked areas.
4	--	PLC Link	Added M1700~M1715. When the flag is ON, you can change the reading parameter from 03 to 04 for the communication 1 ~ 16 respectively.
5	88	PID	Added a new control mode, K9. When MV reaches its upper/lower limit, the accumulated integral value increases according to the MV upper/lower limits and integral gain (KI). So that you can act accordingly if the controlling parameters vary.
6	50	REF	Use REF instruction to work with M1672 ~ M1675. When the flag is ON, refresh the current corresponding output position of the high-speed output points Y0 ~ Y3 in D devices.
7	--	Read the MAC address of the network module	Added M1145 to read the MAC address of the left-side network module EN01 and store the data in D1401~D1403.
8	--	M1019	When M1019 is set to ON, if PLC is suffering from insufficient 24VDC power supply, an error LED indicator will blink rapidly to signal personnel on site to check the power supply.

2.7 UPDATE – DVP-ES2-E Series PLC firmware updated to V1.42

Series	Models	Firmware Version	Release Date
DVP-ES2-E	DVP20ES200TE DVP20ES200RE DVP32ES200TE DVP32ES200RE DVP40ES200TE DVP40ES200RE DVP60ES200TE DVP60ES200RE	V1.40→ V1.42	20200928 (W2040)

Changes:

1	Ethernet Communication	Communication timeout occurs while using ISPSoft to connect to ES2-E series PLC (V1.40) via Ethernet communication. Use WPLSoft to connect to ES2-E series PLC (V1.40) to read the PLC information via Ethernet communication, a communication timeout may occur.
		Solutions: (choose either one) 1. Use RS232 communication. 2. Upgrade the firmware to V1.41 or later version.
2	LDZ, DLDZ	Fixed an issue that even after using the LDZ / DLDZ instruction and successfully compiling the program on ISPSoft, once downloading the program to PLC, it responses with a syntax error.

2.8 NEW – IES Industrial Ethernet – DVS series

DVS Series are Layer 3 and Layer 2 Industrial Ethernet Switches providing high density performance in harsh and hazardous industrial environments specially.

The Layer 3 switches route and determine network paths to correctly transmit packets to the designated IP address for exchanging data between different subnets. Handling routing packets by hardware, Delta Layer 3 switches combine the latest technology in hardware and software engineering to adapt to rugged industrial environments. With fast processing speed as an advantage, it can achieve network transmission that is as fast as or close to wired communicating speed.

With their built in WEB based management interface, offer an easy to use, platform independent management and configuration facility. Powerful traffic management of IGMP and QoS features to take full advantage of constrained network resource and guarantee the best performance.
DVS Managed Ethernet Switches support DELTA ONE RING, ONE CHAIN and STP/RSTP/MSTP for network redundancy to maximize system reliability. Excellent ruggedized hardware design with 12 to 48 VDC redundant power inputs, wide operating temperature range of 40 to 75 without the use of in ternal fans, and LEVEL 3&4 of immunity to electromagnetic interference (EMI) well beyond what is currently delivered by commercial grade networking products, providing superior reliability.

1. Electrical and Hardware Specifications
Unmanaged Industrial 8 Port GbE Ethernet Switch
Advantages

- Transparent transmission of VLAN tagged packets
- Auto warning by relay output for power failure
- 12 to 48 VDC redundant terminal block power input with 10 to 24VAC
- Jumbo frame size up to 9,216 Bytes
- -40℃ to 75℃ wide operating temperature
- Compatible with various industrial protocols, including EtherNet/IP, Profinet, CC-LINK IE, and DNP 3.0

■ Technology

Standards	IEEE 802.3 10Base-T IEEE 802.3u 100Base-T(X) IEEE 802.3ab 1000Base-T IEEE 802.3x Flow Control
Processing Type	Store and Forward
	IEEE 802.3x flow control in full duplex Back- pressure flow control in half duplex

■ Interface

Gigabit Ethernet Ports	RJ45 Ports	10/100/1000Base-T, auto MDI/MDI-X, auto negotiation
Alarm Relay(DO)		1 set relay output with current carrying capacity 1.5A@24VDC

■ Ethernet Performance

Switching Capacity	16Gbps, wire-speed, non-blocking switching fabric
MAC Table	4K
Packet Buffer Memory	1.5M bits
Transparent Forwarding VLAN Tagged Packets	Default enabled

■ Power Requirement

Input Voltage	2 sets, 12 to 48 V_{DC}/10 to 24 V_{AC} redundant terminal block input
Power Consumption	2.8W Max
Overload Current Protection	Present, max. input current 5A
Reverse Polarity Protection	Present

■ Physical

Housing	IP30 protection, metal case
Dimensions	95 mm(H) x 40 mm(W) x 100 mm (D)
Weight	500g
Installation	Industrial DIN-Rail and wall mounting

■ Environmental Limits

Operating Temperature	-40℃ to 75℃(-40℉ to 167℉)
Storage Temperature	-40℃ to 85℃(-40℉ to 185℉)
Ambient Relative Humidity	5% to 95% (non-condensing)

■ Approval

Safety	UL 61010, EN 62368-1, RCM, KC
EMI	FCC 47 CFR Part 15 Subpart B Class A, IEC 61000-6-4, EN 55011, EN 55032(CISPR 32)
EMS〔IEC 61000-6-2, IEC 61131-2, EN 55024, EN 55035〕	EN 61000-4-2 Level 3, EN 61000-4-3 Level 3, EN 61000-4-4 Level 3, EN 61000-4-5 Level 3, EN 61000-4-6 Level 3, EN 61000-4-8 Level 4

2. Ordering Information

Product		Port Combination		Interface			Region
Model Name	Operating Temperature	10/100/1000 Base-T	10/100Base-T(X) Combo 100Base-SFP	DI	DO (Relay)	Power Input	
DVS-G008W01	-40℃ to 75℃	8	---	---	1	2	Worldwide
DVS-G008W01-KR	-40℃ to 75℃	8	---	---	1	2	South Korea

3. Released Date

Model Name	Date	Minimum Order Quantity (pcs)	Lead time
DVS-G008W01	14-Oct-2020	12	14 weeks(if out of stock)
DVS-G008W01-KR	14-Oct-2020	12	14 weeks(if out of stock)

3 Application

3.1 NEW – Application Notes

New application notes have been published recently on our ftp-site:

- Electronics Industry Notification - Air-Tightness Test System.pdf
- Electronics Industry Notification - Delta M-R Controller_Automatic Wrapp....pdf
- Electronics Industry Notification - SMT Inspection Machine Solution.pdf
- Logistics Industry Notification - Line Shaft Diverter Solution.pptx
- Packaging Industry Notification - Vertical Packaging Machine Solution.pdf
- Robot Industry Notification - ITA Fan Upper Cover Precise Glue Spreader Solution.pdf
- Machine Tool Industry Notification - PC-Based Servo Punching Machine System.pdf
- Rubber Plastics Industry Notification - Delta Vertical Injection Moldin....pdf

3.2 NEW – Motor Protection on Variable Frequency Drives

Delta VFD provide a set of built-in protective measures for the motor. This document describes how to activate and adjust those measures.
You can find the up to date application note, DEN_IA_VFD_Motor_Protection_AN_EN_20200917.pdf on the ftp-site,
Folder: \Customer-Service\Industrial Automation Products\Drive & Power Quality\General-VFD\VFD-General Applications

3.3 NEW – Feeding Variable Speed Drives from Residual Current Devices

This application note will guide you through the process of selecting the right components in order to operate a VSD from an RCD.
You can find the up to date application note, DEN_IA_VSD_RCD_AN_EN_20200728.pdf on the ftp-site,
Folder: \Customer-Service\Industrial Automation Products\Drive & Power Quality\General-VFD\VFD-General Applications

4 FAQ

4.1 VFD Series AC Motor Drives

CP2000

Q **Why is my new CP2000 no longer following the deceleration ramp set in pr01-13?**

A *For models 220V/440V 160kW and above the default setting of pr06-02 is 1.*

6. Parameter default setting has modify (above 160kW)

	06-02	Selection for Stall Prevention	
			Default: 0
		Settings	0: Traditional over-voltage and traditional over-current stall prevention
			1: Smart over-voltage and traditional over-current stall prevention
			2: Traditional over-voltage and smart over-current stall prevention
			3: Smart over-voltage and smart over-current stall prevention

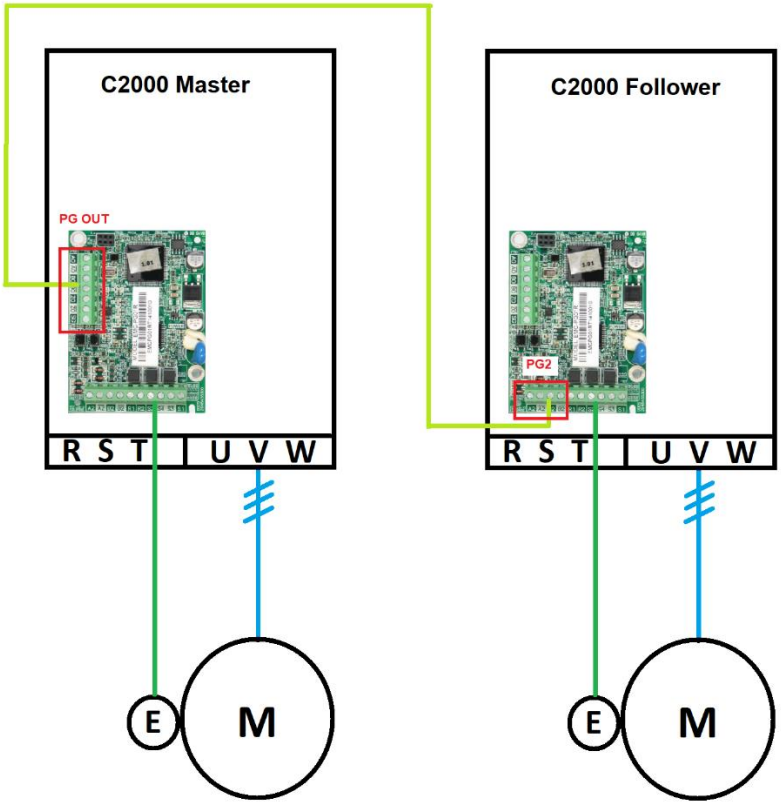
When this setting is active the drive tries to decelerate as quickly as possible based on the DC Bus voltage. In order for the drive to follow the set deceleration ramp pr06-02 has to be set to 0 or 2.
This change was implemented starting with firmware V2.06

C2000

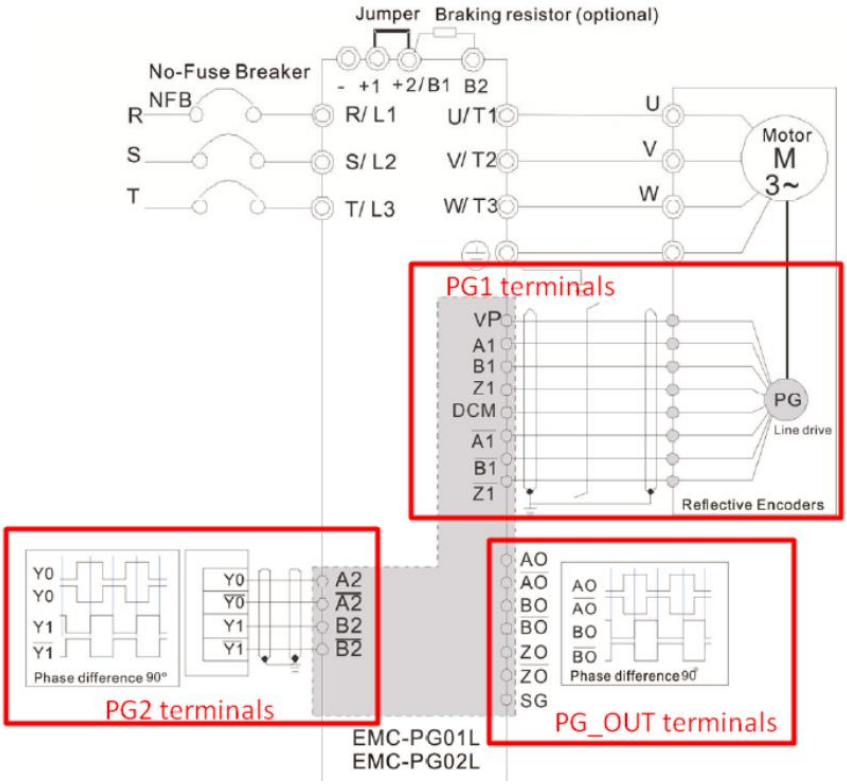
Q **Can I configure two C2000 drives in a Master/Follower setup?**

A *Yes, there are a number of ways that this can be done.*

Below is one example in which two C2000 drives can be synchronized either in Speed or in Position. In this example both C2000 drives have a PG card connected to their Slot 2 and both are running a motor in FOCPG mode. The PG OUT terminals of the Master are wired directly to the PG2 terminals on the Follower.



Every PG encoder card comes with the following terminals:



PG1 are input terminals for getting the encoder signal from the motor so that you can control it in FOCPG mode (closed-loop vector)

PG2 are input terminals for getting encoder pulses from external devices into the drive. The drive can use those pulses as a frequency command or as a position command. Or, if the onboard PLC is used, it can also be used internally for other purposes.

PG_OUT are output terminals. The drive takes what it gets through the PG1 terminals and outputs it on the PG_OUT terminals so that they can be sent to other devices.

Once the wiring shown above is done there are still a few parameter settings which have to be made on the C2000 Follower drive:

- *frequency source pr00-20=5*
- *pulse type pr10-16 = 1 or 2*
- *electrical gear pr10-17 and pr10-18 will set the ratio between the master and follower*
- *acceleration/deceleration and S-ramps pr01-12, pr01-13, pr01-24 ~ pr01-27. This will prevent the follower drive from having any delay*