

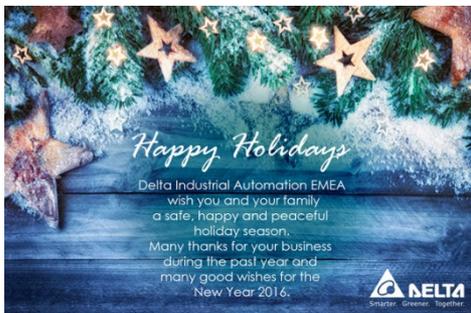
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## 1 News

### 1.1 Merry Christmas and Happy New Year



Dear Customer,

Delta's EMEA Industrial Automation sales team wishes you and your family a Merry Christmas and a Happy 2016. We've had a very good year. We thank you for your well-appreciated efforts to achieve this with us. We'll continue to support you and contribute to your success in 2016.

*Alan, Alejandro, Alessandro, Amr Sadek, Annalisa, Arnoud, Bahaa, Barry, Basel, Cindy, Cristian, Davide, Dick, Enric, Ernesto, Eunice, Farhod, Giuliano, Holger,*

*Jason, Jean-Charles, Jeroen, Joan, Joe, Joost, Jorge, Josep, Jurij, Kenny, Kevin, Luca, Marco, Mazen, Michael, Monique, Paolo, Pere, Philippa, Sabine, Sergey, Simone, Thierry, Tim, Valerie, Vittorio, Vladimir, Weiping*

### 1.2 ftp-site link

Just to let you know (again), you can find the latest info about our products (manuals, pictures, catalogues, application notes, presentations, 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

### 1.3 SPS/IPC/drives in Nuremberg



Delta Industrial Automation participated for the 4<sup>th</sup> consecutive year in SPS IPC Drives in Nuremberg , from November 24<sup>th</sup> - 26<sup>th</sup>, 2015!

The booth focussed on the company’s smart and highly integrated solutions for industrial automation and energy management applications. Industrial Automation also demonstrated its complete line of industrial automation products including: AC motor drives, AC servo drives, PLCs, HMIs, industrial Ethernet

switches, smart sensors, machine vision solutions, power meters, flow meters, and temperature controllers.

Several new products were showcased: the MS300/MH300 compact drives, the high-power AC motor drives with a fully engineered IP54 cabinet, the multi-pump solution, suitable for water pumps in HVAC systems, water treatment and other applications that require multi pump control – being supported by remote connection via a 3G router and Delta’s VidaGrid™ cloud service.

Additionally, an Innergie (a brand of Delta) - charging table was situated in the centre of the booth allowing our visitors to charge their mobile devices whilst in meetings or whilst taking a look at the broad range of products/solutions that were being showcased.



We were happy to welcome many visitors to our booth and hope to continue building strong relationships with our customers at SPS !

## 2 Product update

### 2.1 NEW –CP2000 firmware upgraded from 1.22 to 1.23

Function correction		
	Version 1.22 problem	Version 1.23 correction
1	Circulative Control function works with fire mode. To set up MFI=58 Enable fire mode (with RUN Command) and 59 Enable fire mode (without RUN Command) at the same time, the Relay output will get wrong.	The MFI can't set up function item 58 and 59 at the same time.
2	The Pr01-11 Output Frequency Lower Limit setting is very high (such as 39Hz). When the drive is at "from sleep go to wake up" status, the output frequency will rising very fast and will cause a large current.	The Pr01-11 Output Frequency Lower Limit setting is very high. The sleep and wake up function can work normally.
3	Pr12-00 Circulative Control =2 Fixed Quantity, Pr12-08 Frequency when stopping auxiliary motor (Hz)=25Hz. The relay is keeping switch even the output frequency has reached a constant speed.	Pr12-00=2 can work normally.
4	Pr00-29 Local/Remote Selection =4 Switching Local/Remote, the drive runs as LOCAL setting when switch to Local and runs as REMOTE setting when switch to Remote for frequency and operation status. REMOTE switch to LOCAL, the frequency command can't remain as REMOTE command.	REMOTE switch to LOCAL, the frequency command will remain as REMOTE command.

5	The parameter 01-09 can't be modified.	Pr01-09 can be set up.
6	Power on again, when start running, the start frequency is only available from 0.5Hz (Pr01-09).	Power on again, when start running, the start frequency will be available from 0.5Hz (Pr01-09) or min. frequency(Pr01-07).
7	When a PID feedback error has happen, stop and run again, this will cause a PID feedback error happen immediately.	PID feedback error detect will refer to the Pr08-14 PID Deviation Time setting.
8	The MO is defined as fault indication. When BB function terminal is ON, the MO will active. This will cause system stop.	The BB function will not cause a MO terminal active.
9	To turn ON the FWD or REV terminal during the STO error is in process, the drive will automatically work after the STO error has lifting.	To turn ON the FWD or REV terminal during the STO error is in process, after the STO error has lifting: Pr06-44 = 0 (Latch), a Reset command is need to clear STO Alarm. Waiting for a new Run command and does not refer to Pr02-35 setting (as 02-35=0). Pr06-44 = 1 (not Latch) · the STO Alarm will be cleared automatically. Waiting for a new Run command and does not refer to Pr02-35 setting (as 02-35=0).
10	When the EF terminal was at ON status, change this MI terminal parameters setting will cause this EF signal cannot be Reset.	When the EF terminal was at ON status, change this MI terminal parameters setting, this EF signal still can be Reset.
11	The Pr06-08 and Pr06-11 Over-torque Detection Time setting range is 0.0~60.0 seconds, But, the keypad display setting is 0.1~60,0 seconds.	The OT1/OT2 detected time setting is 0.0~60.0 seconds.
12	Multi-function Output AFMx= Power is work abnormally.	Multi-function Output AFMx= Power is work normally.
13	The Accel./Decel. Time didn't according to the setting of parameter Pr06-05 Accel./Decel. Time Selection of Stall Prevention at Constant Speed function during OC Stall.	The parameter Pr06-05 can work normally.
14	When the Pr00-04 set as below item will display incorrect. 1. 00-04=36 Present operating carrier frequency of drive→the display show "NONE" 2. 00-04=39 Output Torque→the display show "None".	The Pr00-04=36 display normally. The Pr00-04=39 become reserved.



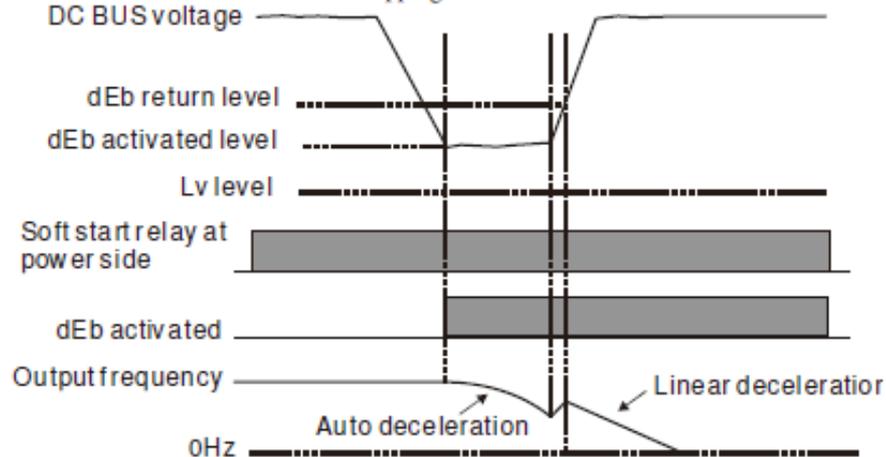


dEb action illustrated as follows :

When the DCBUS voltage has drop down and smaller than the dEb activated level, the dEb function start to work (the soft start relay is close), drive will do the auto deceleration.

**Situation 1 :** momentary power loss/ power supply too low and unstable/ power supply sliding down because of the sudden heavy load  
Pr07-13=1 and power reply

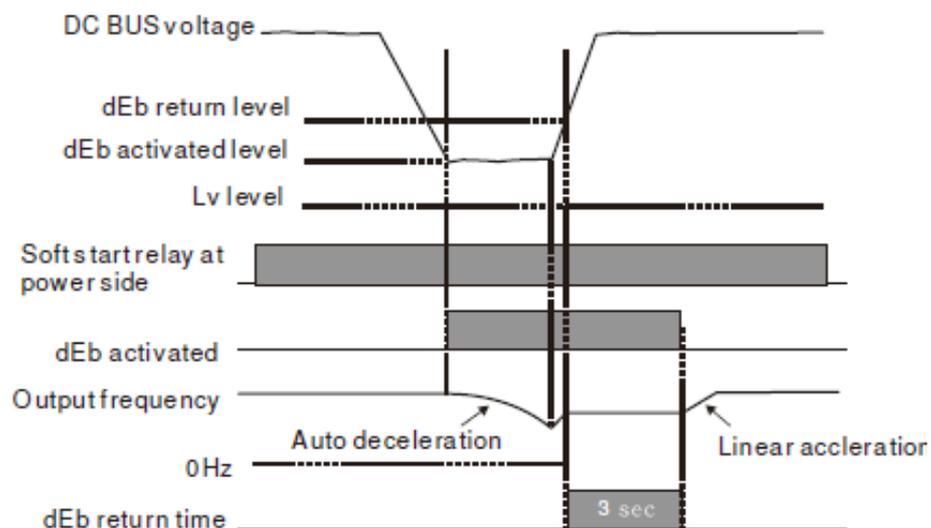
When the power reply and DCBUS voltage has higher than dEb return level, the drive will linear decelerated to 0Hz and stop. The keypad will display “dEb” warning until manually reset and this can avoid that users do not know the reason for stopping.



**Situation 2 :** momentary power loss/ power supply too low and unstable/ power supply sliding down because of the sudden heavy load

Pr07-13=2 and power reply

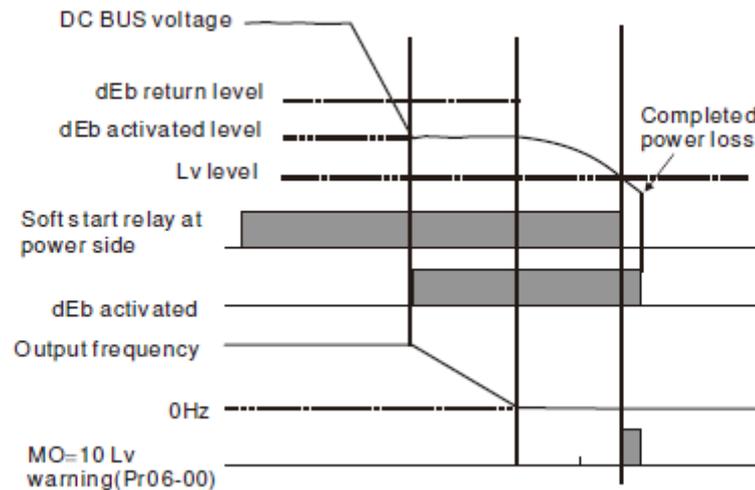
During the dEb deceleration time (include 0hz run), if the power reply and DCBUS voltage has higher than dEb return level, the Drive will maintain the current frequency for 3 seconds and restart to accelerated, the keypad dEb warning will cleared automatically.



**Situation 3 :** Power supply unexpected shut down/power loss

Pr07-13=1 and power will not reply

The keypad will display “dEb” warning and decelerated to 0Hz and stop. When the DCBUS voltage has smaller than Lv level, the drive will disconnect soft-start relay and completely out of power.



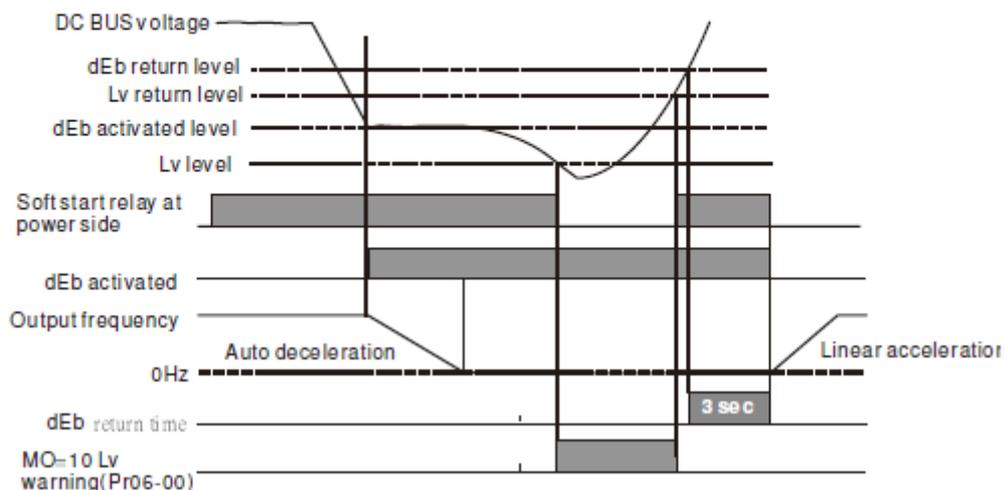
**Situation 4 :** Power supply unexpected shut down/power loss

Pr07-13=2 and power will not reply

The drive will decelerate to 0Hz. The DCBUS voltage will continue to reduce until the voltage is less than Lv level and drive will disconnect soft-start relay. The keypad will display “dEb” warning until completely out of power .

**Situation 5 :** Pr07-13=2 and Power will reply after DCBUS voltage has smaller than Lv level

The drive will decelerate to 0Hz. The DCBUS voltage will continue to reduce until the voltage is less than Lv level and drive will disconnect soft-start relay. The power reply and DCBUS voltage has higher than Lv level and drive will disconnect soft-start relay. When the DCBUS voltage has higher than dEb return level, the Drive will maintain the current frequency for 3 seconds and restart to linear accelerate, the keypad dEb warning will cleared automatically.



### New Function

#### 1. Add new parameter Pr06-49 LvX Auto Reset

06-49	LvX Auto Reset			Factory Setting: 0
	Settings	0: Disable 1: Enable		

- ☐ Pr 06-49=0: Disable; LvA · Lvd · Lvn error will be record and need to be reset
- ☐ Pr 06-49=1: Enable; LvA · Lvd · Lvn error will be record. The DCBUS voltage has reach Lv reset level and the Soft start Relay has turn ON, the LvX error will be reset automatically.

#### Availability

Version	Series number		
V1.23	WJ	1~10HP	W1543
		15HP and above	W1542

#### 2.2 **NEW** –C2000 firmware upgraded from 1.20 to 1.21

### Function correction

	Version 1.20 problem	Version 1.21 correction
1	When the ACI input is working at negative gain, it will not be limit at -100%.	When the ACI input is working at negative gain, it will be limit at -100%.
2	When b.b. function is active, turn ON the JOG command via external terminal and turn OFF. Turn OFF the b.b. function, the drive will run with 6Hz such as JOG run.	When the b.b. is active, the drive will not accept any Run command.
3	The operation direction command will sometime be changed after a fault reset.	The operation direction command will not be changed after a fault reset.
4	The Pr01-34=2 and the Pr01-11 is not 0Hz. When the frequency command is $\leq$ Pr01-07, the drive will suddenly speeds up to Pr01-11 (lower frequency) setting value.	The Pr01-34=2 and the Pr01-11 is not 0Hz. When the frequency command is $\leq$ Pr01-07, the drive will speeds up to Pr01-11 (lower frequency) setting value according to the acceleration time setting.
5	The definition of PLC M1015 Frequency attained is no uniform. The M1015 turn ON timing is different between frequency command source is KPC-CC01 and analog input.	The definition of PLC M1015 will as same as MOx=2.
6	When the drive is at TQCPG mode, press the FWD/REV key during operating will cause output H become "0" and motor stop.	TQCPG control mode, the FWD/REV key command is not valid.
7	The frequency command source is analog input, when using the bias setting, the output frequency is not correct. AUI input, 0-10V input signal corresponds to -25Hz~25Hz. When the voltage is 0V, F	The analog input can work normally.

	displays 0; AUI input slowly increased to 5V, the F suddenly become -25Hz, and then slowly becomes 0Hz.	
8	The torque compensation is too small.	The torque compensation value is appropriately.
9	The Slip compensation function to calculate real time current AD value has error.	The Slip compensation function to calculate real time current AD value is correct.
10	The MO is defined as fault indication. When BB function terminal is ON, the MO will active. This will cause system stop.	The BB function will not cause a MO terminal active.
11	To turn ON the FWD or REV terminal during the STO error is in process, the drive will automatically work after the STO error has lifting.	To turn ON the FWD or REV terminal during the STO error is in process, after the STO error has lifting: Pr06-44 = 0 (Latch), a Reset command is need to clear STO Alarm. Waiting for a new Run command and does not refer to Pr02-35 setting (as 02-35=0). Pr06-44 = 1 (not Latch) · the STO Alarm will be cleared automatically. Waiting for a new Run command and does not refer to Pr02-35 setting (as 02-35=0).
12	During static Auto Tuning, all MO terminals are OFF status. If there is M.C. switch installed between the drive and motor and it's ON/OFF is controlled by the drive, thus, drive cannot complete the Auto Tuning.	During Auto Tuning, only a few MO function will be disable: 12 Mechanical brake release 29 Output when frequency >= Pr.02-34 (>= 02-34) 42 Crane function 47 Closed brake output 63 Advanced Crane
13	If the Pr02-32=0, the MOx=12 terminal will turn ON immediately after a Stop command is given.	The Pr02-32=0. The MOx=12 terminal can be turn ON only when the drive is complete stop.
14	MOx=47: Closed brake output function is not correct.	MOx=47: Closed brake output function can work normally.
15	Multi-function Output AFMx= Power is work abnormally.	Multi-function Output AFMx= Power is work normally.
16	The function Pr05-22 Induction Motor 1/ 2 Selection and Mix=14 "Switch between motor 1 and motor 2" are both enable at the same time, the drive does not follow the Mlx=14 terminal status.	When the Mix=14, the Pr05-22 function become Read Only. The Mix=14 function priority is higher than Pr05-22.
17	The Pr01-11 Output Frequency Lower Limit setting is very high (such as 39Hz). When the drive is at "from sleep go to wake up" status, the output frequency will rising very fast and will cause a large current.	The Pr01-11 Output Frequency Lower Limit setting is very high. The sleep and wake up function can work normally.
18	The Pr06-08 and Pr06-11 Over-torque Detection Time setting range is 0.0~60.0 seconds, But, the keypad display setting is	The OT1/OT2 detected time setting is 0.0~60.0 seconds.

	0.1~60.0 seconds.	
19	CANopen Index 6078 and 6064 do not meet the DS 402 definition.	CANopen Index 6078 and 6064 both meet the DS 402 definition.
20	After Auto-tuning, Pr00-11 control mode setting will be reset as factory setting.	After Auto-tuning, Pr00-11 control mode setting will not be reset as factory setting.
21	The driver stops method is the "Free Run Stop". At the moment of restart to run, the drive output power will directly jump up.	The drive output power will start from zero.
22	The Accel./Decel. time didn't according to the setting of Pr06-05 Accel./Decel. Time Selection of Stall Prevention at Constant Speed during OC Stall.	The parameter Pr06-05 can work normally.
23	No any IO card has installed on the C2000. The Pr02-70 display "7", this is different to the default setting.	The Pr02-70 will display "0" when there is no IO card has installed on the C2000. Pr02-70 IO Card type: 02-70= 0 No IO Card 02-70= 1 EMC-BPS01 Card 02-70= 2 No IO Card 02-70= 3 No IO Card 02-70= 4 EMC-D611A Card 02-70= 5 EMC-D42A Card 02-70= 6 EMC-R6AA Card 02-70= 7 No IO Card
24	A Reset command is sending via communication card will sometime cause current fluctuations.	Before accepting a Reset command via communication card, the drive must at an error happen and can accept a reset command status.
25	Enable speed search function. Give a Stop command during speed search, only after speed search has completed, the drive will start to do deceleration stop.	During speed search, give a Stop command, the drive will free run stop.
26	At the FOCPG mode, the output power display is incorrect.	At the FOCPG mode, the output power display is correct.

### Function modify

- When the speed search(VF/SVC mode)=Speed search from minimum output frequency, the current Limit for Speed Search will be coupled with OC stall current level, whichever is the smallest values for speed search current.  
The FOC Sensor-less mode will not follow VF/SVC mode. The speed search current limit is Pr06-12 settings.
- When the multi-function input function item 6 JOG command has been selected, then, the item 24 FWDJOG and 25 REVJOG couldn't be select. During the JOG running (include FWD JOF and REV JOG), the FWD or REV command is no effective.
- To modify Pr05-00=4 auto-tuning for PM motor PG offset angle method.
- To modified Pr02-10 The Acceleration/Deceleration Speed of the UP/DOWN Key with Constant Speed setting range and factory setting.

✓	<b>02-10</b>	The Acceleration/Deceleration Speed of the UP/DOWN Key with Constant Speed				Factory Setting:0.001
		Settings	0.001~1.000Hz/ms			

- Maximum output frequency limit refer to carrier frequency:  
VF mode : Maximum output frequency = carry frequency setting / 10  
FOC mode : Maximum output frequency = carry frequency setting / 20

The setting of Pr01-00 will not be limit. When the carry frequency setting and maximum output frequency relationship is meet the definition, the actual output frequency will limit by the Maximum output frequency setting.

Ex : VF mode,

Pr01-00=599.00Hz, carry frequency=2KHz → actual maximum output frequency=200.00Hz

Which mean the drive maximum output frequency=200.00Hz (F=599.00Hz, H=200.00Hz).

If the carry frequency=9KHz, maximum output frequency=599.00Hz (9000/10=900.00Hz, but Pr01-00 is only up to 599.00Hz)

F=599.00Hz, H=599.00Hz, when the "De-rated Protection"= carrier frequency (Fc) outputted by PWM will auto decrease according to surrounding temperature and the carry frequency will drop 1kHz every 5 seconds 1KHz.

When the carry frequency has drop down to 5KHz, the actual maximum output frequency=500.00Hz (F=599.00Hz, H=500.00Hz)

When the carry frequency has drop down to 3KHz, the actual maximum output frequency=300.00Hz (F=599.00Hz, H=300.00Hz)

Heavy Duty: the maximum setting of Pr01-00 is 599.00Hz. But, the actual maximum output frequency will limited to 300.00Hz.

- Pr06-35 setting value has change to become 1 decimal point.

	<b>06-35</b>	Output Current at Malfunction				Factory Setting: Read only
		Settings	0.0~6553.5Amp			

7. VF curve factory setting has change as below:  
 Pr01-01/01-35=60Hz; Pr01-02/01-36=400V/200V (230V class)  
 Pr01-03/01-37=3.0Hz; Pr01-04/01-38=22V/11V (230V class)  
 Pr01-05/01-39=1.5Hz; Pr01-06/01-40=10V/5V (230Vclass)  
 Pr01-07/01-41=0.5Hz; Pr01-08/01-42=2V/1V (230V class)
8. P05-33 has higher priority compare to control model and auto-tuning mode selection. For example, if the Pr05-33=0 IM motor, then the Pr05-00 can't use "13" HFI and Pr00-11 can't use 4 FOCPGPM control..
9. The TMR of PLC can dynamically define time unit.
10. CANopen 使用台達自定義的解碼方式時，其控制模式應該使用 2060-02 來解譯比較合理。修改寫入 6060h 時自動映射到 2060-2，反之寫入 2060-2 時自動映射到 6060h
11. Pr05-04 and Pr05-16 IM motor pole's setting max. value has modified from 20 to 64.
12. At TQC sensorless control mode, the JOG command has modified from VF mode to FOC sensorless mode. Thus, when JOG command is operating, torque limit function will be effectively.
13. At VF control mode, during operating, use PLC to set up DC injection is valid.
14. The drive power range is 355Kw and above, the Pr00-01, 05-01, 05-13, 05-05 and 05-17 have modified setting value to become 1 decimal point.
15. To modify dEb function

↗	<b>07-13</b>	dEb function selection				Factory Setting: 0
		Settings	0: Disable			
			1: dEb with auto accel./decal., the output frequency will not return after power reply.			
			2: dEb with auto accel./decal., the output frequency will return after power reply.			

- dEb (Deceleration Energy Backup) let motor drive decelerates to stop when momentary power loss occurs. When the power loss instantly, drive can use this function to let motor decelerated to zero speed. If the power is reply, drive can restart the motor.
- Lv return level : default value will depend on the drive power model  
 Frame A, B, C, D = P06-00 + 60V/30V(220V class)  
 Frame E and above = P06-00 + 80V/40V(220Vclass)
- Lv level : default =Pr06-00
- During the dEb, the drive can also be protected by ryF, ov, oc, occ, EF...etc and those error codes will be recorded.
- during the dEb deceleration time, the Stop command will be ineffective. If really need to stop the drive, please use another function such as EF.
- During the dEb time, the "BB" function is ineffective until dEb disable.
- Even the Lv warning will not appear during dEb time, but the MO=10 "Low voltage warning" will active if the DCBUS voltage is lower than the Lv level.

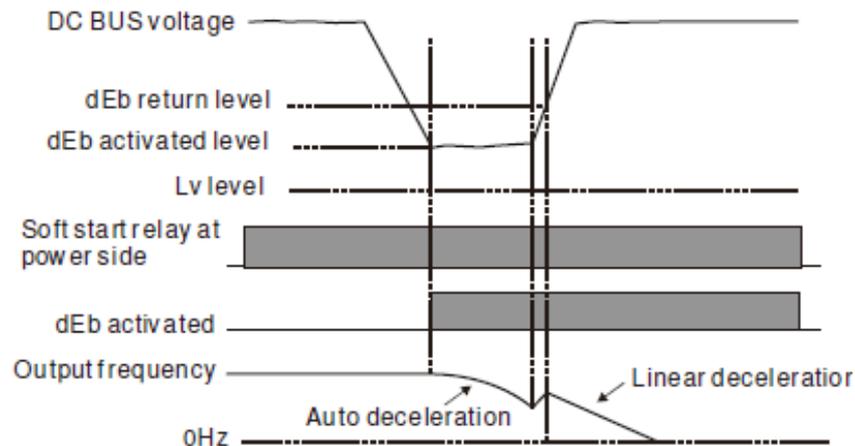
dEb action illustrated as follows :

When the DCBUS voltage has drop down and smaller than the dEb activated level, the dEb function start to work (the soft start relay is close), drive will do the auto deceleration.

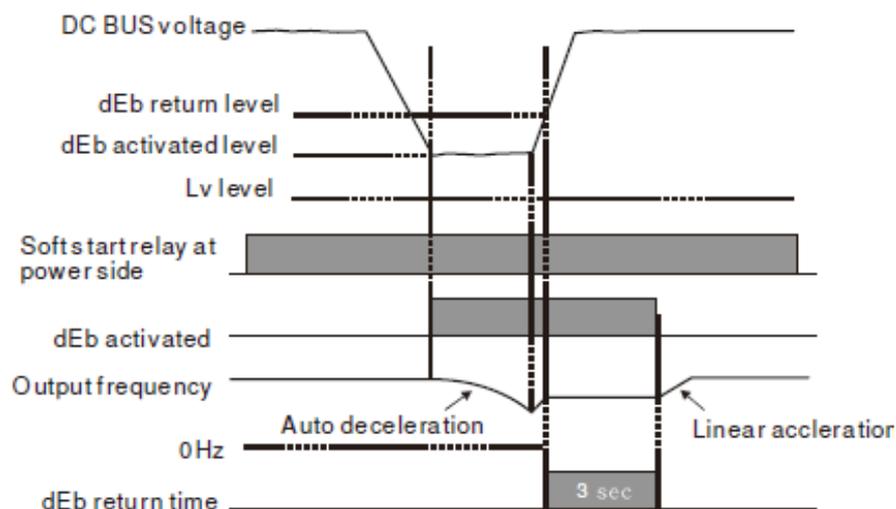
**Situation 1 :** Momentary power loss/ power supply too low and unstable/ power supply sliding down because of the sudden heavy load

Pr07-13=1 and power reply

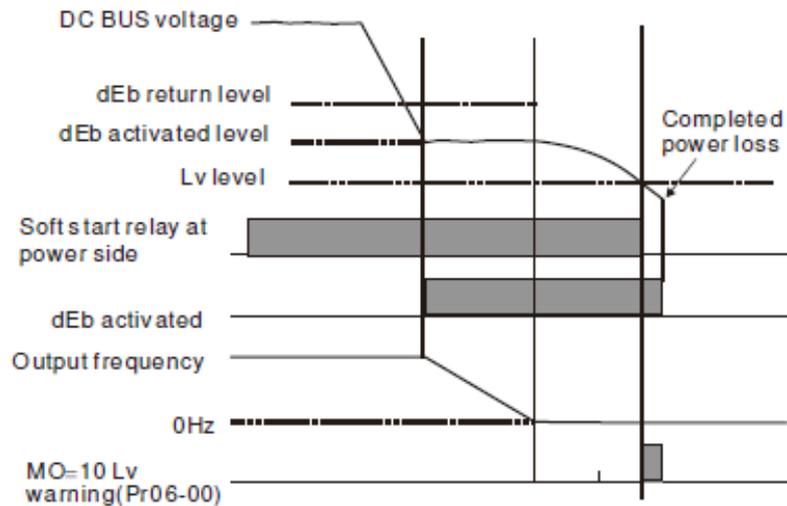
When the power reply and DCBUS voltage has higher than dEb return level, the drive will linear decelerated to 0Hz and stop. The keypad will display "dEb" warning until manually reset and this can avoid that users do not know the reason for stopping.



**Situation 2 :** Momentary power loss/ power supply too low and unstable/ power supply sliding down because of the sudden heavy load  
 Pr07-13=2 and power reply  
 During the dEb deceleration time (include 0Hz run), if the power reply and DCBUS voltage has higher than dEb return level, the Drive will maintain the current frequency for 3 seconds and restart to accelerated, the keypad dEb warning will cleared automatically.



**Situation 3 :** Power supply unexpected shut down/power loss  
 Pr07-13=1 and power will not reply  
 The keypad will display "dEb" warning and decelerated to 0Hz and stop. When the DCBUS voltage has smaller than Lv level, the drive will disconnect soft-start relay and completely out of power.



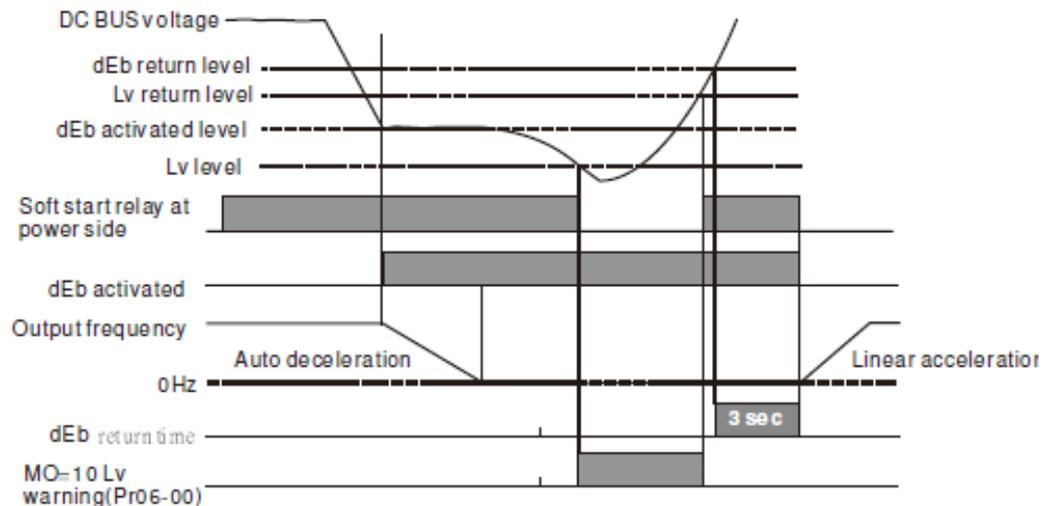
**Situation 4 :** Power supply unexpected shut down/power loss

Pr07-13=2 and power will not reply

The drive will decelerate to 0Hz. The DCBUS voltage will continue to reduce until the voltage is less than Lv level and drive will disconnect soft-start relay. The keypad will display "dEb" warning until completely out of power.

**Situation 5 :** Pr07-13=2 and Power will reply after DCBUS voltage has smaller than Lv level

The drive will decelerate to 0Hz. The DCBUS voltage will continue to reduce until the voltage is less than Lv level and drive will disconnect soft-start relay. The power reply and DCBUS voltage has higher than LV return level, the soft-start relay close. When the DCBUS voltage has higher than dEb return level, the Drive will maintain the current frequency for 3 seconds and restart to linear accelerate, the keypad dEb warning will cleared automatically.



### New function

1. Add new selection for the Pr01-43 V/F Curve Selection.

01-43	V/F Curve Selection					Factory Setting:0
	Settings	0~15				

Setting	SPEC.	Feature	Purpose
0	Normal V/F curve	Constant torque	For normal application. This required torque for load is the same no matter the rotor speed of motor.
1	5 <sup>th</sup> V/F curve	Variable torque	To set higher level of V/F curve, the torque in low speed is relatively low, which is not recommended for high acceleration/deceleration application.
2	2 <sup>nd</sup> V/F curve		
3	60Hz (voltage saturation in 50Hz)	Constant torque	For normal application. This required torque for load is the same no matter the rotor speed of motor
4	72Hz (voltage saturation in 60Hz)		
5	3 <sup>th</sup> decreasing (50Hz)	Decreasing torque	For fans, pumps, the required torque derating relative to the load.
6	2 <sup>nd</sup> decreasing (50Hz)		
7	3 <sup>th</sup> decreasing (60Hz)		
8	2 <sup>nd</sup> decreasing (60Hz)		
9	Mid. starting torque (50Hz)	High starting torque	Select high starting torque when: <ul style="list-style-type: none"> <li>● Wiring between the drive and motor exceeds 150 m</li> <li>● A large amount of starting torque is required (like lift)</li> <li>● An AC reactor is installed in the output side of the drive</li> </ul>
10	High starting torque (50Hz)		
11	Mid. starting torque (60Hz)		
12	High starting torque (60Hz)		
13	90Hz (voltage saturation in 60Hz)	Constant output operation	The curve for operation above 60Hz. To operate above 60Hz, the output voltage is fixed.
14	120Hz (voltage saturation in 60Hz)		
15	180Hz (voltage saturation in 60Hz)		

2. Add a new Warning code "105" Estimated speed reverse.
3. When drive is at CANOPEN SLAVE control, a new function is add: CANOPEN master can control drive internal PLC. Thus, need to add the PLC BUFFER into the Delta custom.
4. Add Portugal, Spain and French language for KPC-CC01.
5. Electronic Thermal relay protection rule meet the UL specifications. Add oL1 Counter records at the parameters Pr06-78 and Pr06-77. The EoL1 and EoL2 are "Current type" error, have to wait for 5 sec to reset.
6. Add new parameter Pr06-49 LvX Auto Reset

06-49	LvX Auto Reset					Factory Setting: 0
	Settings	0: Disable 1: Enable				

- ☐ Pr 06-49=0: Disable; LvA · LvD · Lvn error will be record and need to be reset
- ☐ Pr 06-49=1: Enable; LvA · LvD · Lvn error will be record. The DCBUS voltage has reach Lv reset level and the Soft-start Relay has turn ON, the Lvx error will be reset automatically.

### Availability

Version	Series number	
C2000_v1.21	WJ	1546

### 2.3 **NEW** – C200 firmware updated from 1.05 to 1.06

#### Function correction

Item	1.05	1.06
1	Swing function does not work properly	Swing function works properly

#### New function

L. Adding item 37~44 for Pr00-04 (Content of Multi-function Display) °

↗ <b>00-04</b>	Content of Multi-function Display (User-defined)	Factory setting: 3
----------------	--	--------------------

#### Settings

- 37: Reserved
- 38: Display drive status (6.) (Refer to Note 7)
- 39: Display estimated output positive/negative torque(Unit: Nt-m)  
(t 0.0: Positive torque; - 0.0: Negative torque) (C.)
- 40: Torque command (L) (Unit: %)
- 41: KWH display (J) (Unit: KWH)
- 42: PID reference (h.) (Unit: %)
- 43: PID offset (o.) (Unit: %)
- 44: PID output frequency (b.) (Unit: Hz)

If Pr.00-04 = 38,

- Bit 0: The drive is running forward.
- Bit 1: The drive is running backward.
- Bit 2: The drive is ready.
- Bit 3: Errors occurred on the drive.
- Bit 4: The drive is running.
- Bit 5: Warnings on the drive.

#### Availability

Plant	Firmware version	Series number
WJ	1.06	W1546

### 2.4 **NEW** –AH08AD-5A and AH08DA-5A

We are happy to announce the release of two AH500 series analogue modules: AH08AD-5A and AH08DA-5A

**AH08AD-5A** provides 8 channels of analogue input sensing with support of the following sensor types:  
Voltage: -10~+10V, 0~10V, -5~+5V, 0/1~5V  
Current: 0/4~20mA, -20~+20mA

**AH08DA-5A** provides 8 channels of analogue output for the following signal types:  
Voltage: -10~+10V, 0~10V, -5~+5V, 0/1~5V

Current: 0/4~20mA

Both modules also provide high speed conversion time: 150 $\mu$ s per channel and 16 bits hardware resolution.

### Electrical specifications

Module name	AH08AD-5A	AH08DA-5A
Number of inputs	8	8
Analog-to-digital conversion	Voltage input/Current input	Voltage output/Current output
Supply voltage	24V DC (20.4V DC ~ 28.8V DC) (-15% ~ +20%)	
Connector type	Removable terminal block	
Conversion type	150 $\mu$ s / channel	
Isolation	An analog circuit is isolated from a digital circuit by a digital integrated circuit optocoupler, but the analog channels are not isolated from one another. Isolation between a digital circuit and ground: 500V DC Isolation between an analog circuit and ground: 500V DC Isolation between an analog circuit and a digital circuit: 500V DC Isolation between 24V DC and ground: 500V DC	

### Functional specifications

AH08AD-5A								
Analog-to-digital conversion	Voltage input					Current input		
Rated input range	-10~+10V	0~+10V	-5~+5V	0~+5V	1~+5V	-20~+20mA	0~20mA	4~20mA
Hardware input range	-10.1~10.1V	-0.1~10.1V	-5.05~5.05V	-0.05~5.05V	-0.95~5.05V	-20.2~20.2mA	-0.2~20.2mA	3.8~20.2mA
Fiducial error (Room temperature)	+/- 0.1%							
Fiducial error (Full temperature range)	+/- 0.45%					+/- 0.2%		
Linearity error (Room temperature)	+/- 0.07%					+/- 0.05%		
Linearity error (Full temperature range)	+/- 0.12%					+/- 0.23%		
Hardware resolution	16 bits							
Input impedance	>200K $\Omega$					>250K $\Omega$		
Absolute input range	+/- 15V					+/- 32mA		

AH08DA-5A							
Analog-to-digital conversion	Voltage output					Current output	
Rated output range	-10~+10V	0~+10V	-5~+5V	0~+5V	1~+5V	0~20mA	4~20mA
Hardware output range	-10.1~10.1V	0.1~10.1V	-5.05~5.05V	-0.05~5.05V	-0.95~5.05V	-0.2~20.2mA	3.8~20.2mA
Fiducial error (Room temperature)	+/- 0.02%					+/- 0.06%	
Fiducial error (Full temperature range)	+/- 0.04%					+/- 0.07%	
Linearity error (Room temperature)	+/- 0.004%					+/- 0.01%	
Linearity error (Full temperature range)	+/- 0.004%					+/- 0.01%	
Hardware resolution	16 bits						
Permissible load impedance	1 K $\Omega$ ~2 M $\Omega$ : +/- 10V and 0~10V >=500 $\Omega$ : 1~5V					<=550 $\Omega$	

### Ordering Information

#### AH 08 AD - 5 A



AH08AD-5A and AH08DA-5A modules are on stock and ready to be ordered. Please contact your Sales Manager for the price

## 2.5 **NEW** -DVS-G406W01-2GF and DVS-G408W01

We are happy to announce the release of the new Industrial Ethernet Switch (IES):  
DVS PoE Unmanaged series: DVS-G406W01-2GF and DVS-G408W01

Power over Ethernet (PoE) has become increasingly popular in recent years since the technology eliminates the need of power outlets at device locations and makes it easier to configure power supplies.

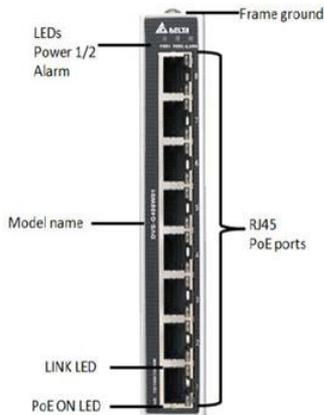
DVS PoE Series provides high-density performance, 30 watts for PoE+ devices and is ideal for high powered devices in harsh environments for industrial applications.

Excellent ruggedized hardware designed with redundant power inputs. Wide operating temperature range of -40°C~70°C without internal 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.

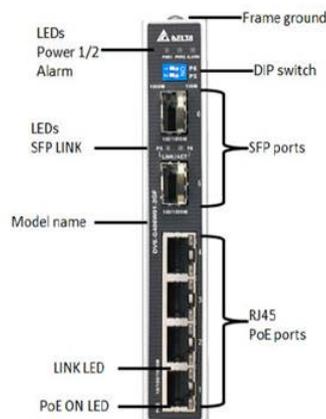
### Electrical and Hardware Specifications

### PoE Unmanaged Gigabit Ethernet Switch

DVS-G408W01



DVS-G406W01-2GF



### DVS-G406W01-2GF

IEEE 802.3 af/at PoE Unmanaged 4-Port 10/100/1000Base-T + 2-Port 100/1000Base-SFP Ethernet Switch

#### Features:

- 4 10/100/1000Base-T PoE(PSE) ports
- Based on IEEE 802.3at standard up to 30Watts per port. Backward compatible with IEEE 802.3af
- SFP ports support 100Base-FX and 1000Base-X dual transmission speed
- Jumbo frame size up to 9K Bytes
- 48 to 57VDC redundant terminal block power input
- Auto warning by relay output for power failure
- Compatible with various industrial protocols: EtherNet/IP, Profinet, EtherCAT,
- CC-LINK IE and DNP 3.0



### DVS-G408W01

IEEE 802.3 af/at PoE Unmanaged 8-Port 10/100/1000Base-T Ethernet Switch

#### Features:

- 8 10/100/1000Base-T PoE(PSE) ports
- Based on IEEE 802.3at standard up to 30Watts per port. Backward compatible with IEEE 802.3af
- Jumbo frame size up to 9K Bytes
- 48 to 57VDC redundant terminal block power input
- Auto warning by relay output for power failure
- Compatible with various industrial protocol: EtherNet/IP, Profinet, EtherCAT,
- CC-LINK IE and DNP 3.0



### Ordering Information

Product		Port Combination			Interface		
Model Name	Operating Temperature	100/1000Base-SFP	10/100/1000Base-T	PoE Port	DI	DO (Relay)	Power Input
DVS-G406W01-2GF	-40°C to 70°C	2	4	4	--	1	2
DVS-G408W01	-40°C to 70°C	---	8	8	--	1	2

### Typical application: Video Surveillance

Power-over-Ethernet networks inject power to the LAN cable to power attached devices, which turns out to be handy for IP-based surveillance systems. The same LAN cable that carries the IP video traffic can power an IP camera for instance. Unmanaged PoE switches provide basic connectivity between networked devices at a low cost.

Please also check product-related documentation on our ftp-site.

DVS-G406W01-2GF and DVS-G408W01 modules are on stock and ready to be ordered. Please contact your Sales Manager for the price.

## 2.6 PHASE OUT – VFD-VE and specific options

We will phase out VFD-VE (VFDxxxVxxX-2) and the belonging options KPV-CE01, EMV-PG01, EMV-PG02, EMV-APP01.

**You can order them still until 30-6-2015.**

## 2.7 NEW –VFD-EL firmware update from 1.12 to 1.13

### Correcting Functions

	Issues in v.1.121	Corrections in v1.130
1	Error such as Aerr (ACI analog signal error) can be occurred easily while using ACI function.	Modify decision making condition of the firmware to prevent triggering Aerr error in normal situation.
2	An error occurred in the reference level of the program which determines the ACI disconnection signal	The minimum ACI reference level is now 0 mA.

### Adding New Functions

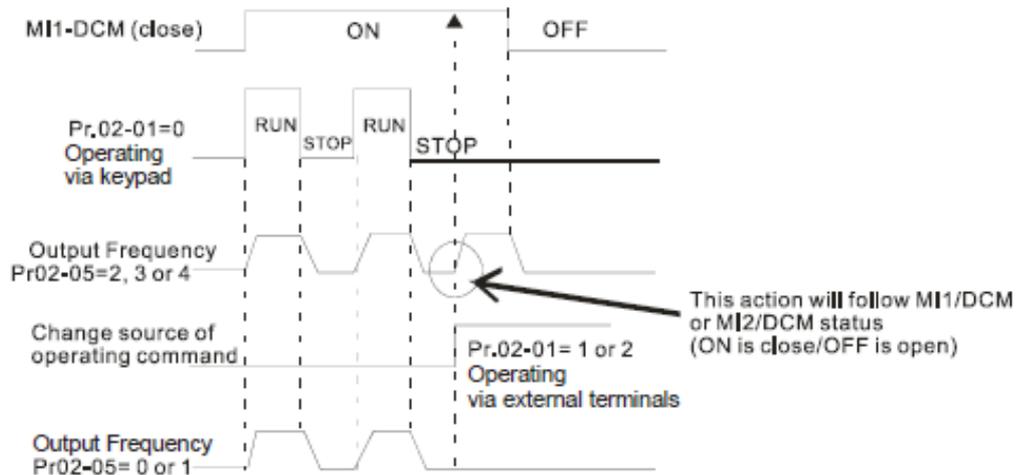
- A new function is added at Pr02-05. #4: The motor drive starts to run at power-on or after reset. When the source of operating command is a two-wire external terminal, the operating command changes as the external terminal's status changes.

**0205** Source of Power-On Command & Operating Command modifies the operating control of motor drive (for external terminals only)

Factory Setting: 1  
 Settings: 0: Start running when power is on.  
 1: Don't run when power is on  
 2: When the source of the command changes, VFD's operation follows the new command.  
 3: When the source of the command changes, VFD's operation follows the new command  
 4: **The motor drive starts to run at power-on or after reset. When the source of command is a two-wire external terminal, the operating command changes as the external terminal's status changes.**

source of operating command is changed to external terminal (Pr.02-01=1 or 2). The status of terminal and AC motor drive is different. And the operation of the AC motor drive will be:

When Pr02-05 is set to 2, 3 or 4, the status of AC motor drive is changed (run or stop) by the terminal status.  
When Pr02-05 is set to 0 or 1, the status of AC motor drive is not changed by the terminal status.



When Pr.02-05 is set to 1 or 3, it does not guarantee that the motor will never run under this condition. It is possible the motor may be set in motion by a malfunctioning switch. Related parameters: Pr.02.01 (Source of First Operating Command)

- 4. **Pre-heat Function:** The pre-heat function produces a low level DC Current that heats up the motor windings to prevent condensation, while motor is de-energized or at rest, which is the same function of motor space heaters. The parameters to set up the motor pre-heat function are Pr08-21[Level of Pre-heat DC Current %] and Pr08-22 [Pre-heat DC Current Cycle Time]. To control pre-heat function, set external terminal MI= 26: Auto-trigger pre-heat function. At power-on, MI= 26 will auto-trigger to start or stop the pre-heat function. Using keypad can also RUN/STOP this pre-heat function. Set external output terminal MO= 24 as an [Indication of Pre-heat Function]. When this function is enabled, MO terminal will be also activated to indicate the status of this function and give warning if there's any error.

### 08-21 Level of Pre-heat DC Current

Factory setting: 0

Settings: 0~100%

- ⓘ This parameter controls the level of the pre-heat DC current input to the motor. The percentage of the pre-heat DC current equals to the percentage of motor rated current (07-00). So when setting up this parameter, increase slowly the level to reach the desired pre-heat temperature.
- Related parameters: Pr08-22 [Pre-heat DC Current Cycle Time], Pr03-00 [Multi-function Output Relay #24: Indication of Pre-heat Function], Pr04-05 ~ Pr04-08 [Multi-function Input Terminal #26: Auto-trigger pre-heat function].

### 08-22 Pre-heat DC Current Duty Cycle

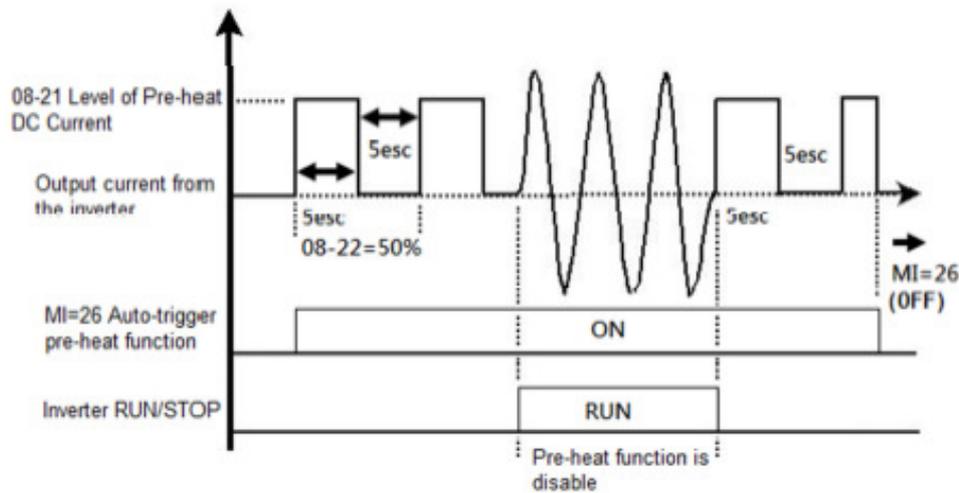
Factory setting: 0

Settings: 0~100%

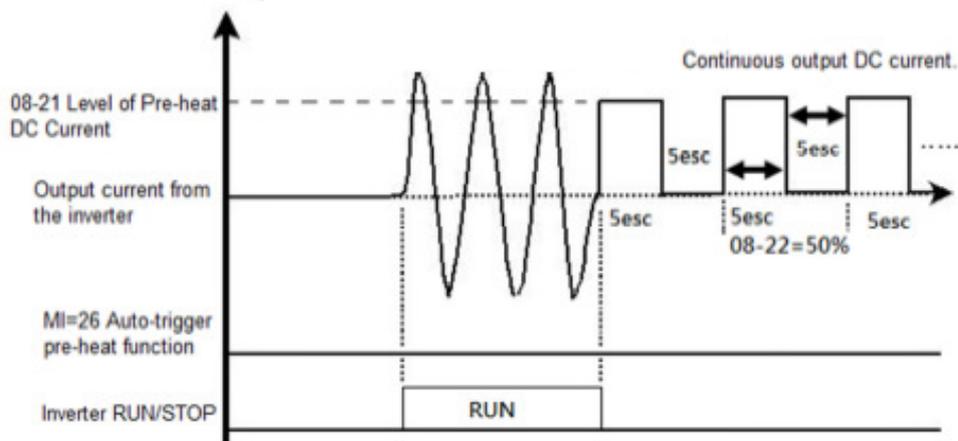
- ⓘ This parameter is to set up the duty cycle of the pre-heat DC current input to the motor. 0% ~ 100% corresponds to 0 sec to 10sec. When the setting is 0%, which means no output current from the motor drive. While setting is 100%, there will be continuous output DC current. For example: when the setting of this parameter is 50%, the

cycle time is to input current to motor for 5 seconds and stop inputting for 5 seconds. When MI #26 is enabled, this parameter will operate periodically with MI#26 until the motor drive start to run motor or until MI#26 is disabled.

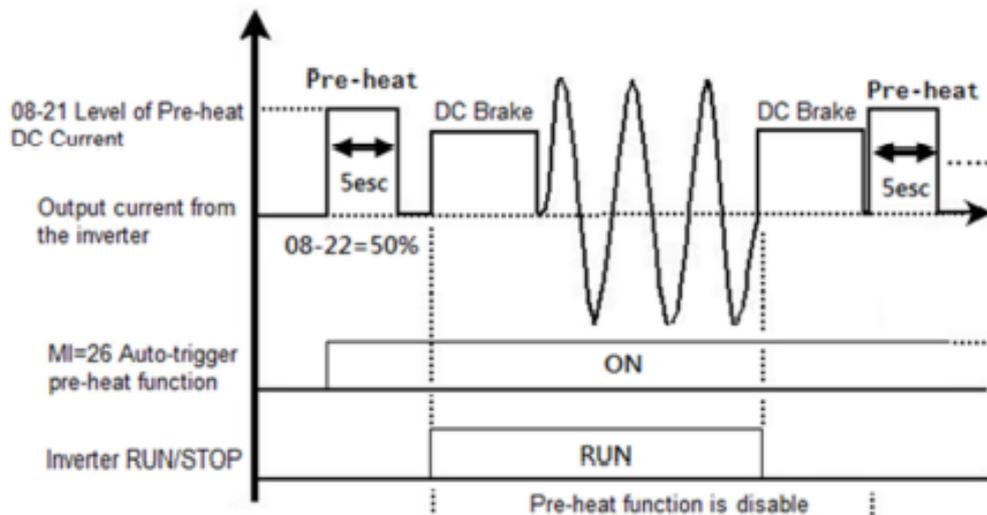
- ☐ The figure below shows the sequential relationship, when MI=26 pre-heat can be auto-triggered, pre-heat DC current is enabled and cycle time is 50%.
- ☐ Pre-heat function works when Pr08-21 and Pr08-22 are not equal to 0.
- ☐ When MI=26 is enabled (Auto-trigger Pre-heat function), MI =26 controls the start and stop of pre-heat function.
- ☐ When MI=26 is DISABLED, the pre-heat function will start when:
  - The motor drive stops its first operation.
  - The motor drive being powered on again to restart its operation.



- ☐ The figure below shows the sequential relationship, when MI=26 pre-heat is disabled, pre-heat DC current is enabled and cycle time is 50%. When the motor drive is stopped, the pre-heat function will start to output DC current continuously.



The figure below shows the Sequential Relation between Pre-heat function & enabling DC brake.



### Pre-Heating: Functions & Notes

1	When the motor drive is set to coast to stop and pre-heating is enabled, as soon as the stop command is given, the motor drive will switch to decelerate to stop. As soon as the motor drive stops completely, the pre-heating function will be enabled right away to prevent huge current produced by the pre-heating at coast to stop.
2	Limit on pre-heat function's carrier wave: In order to reduce the extra energy lose caused by pre-heating, the maximum carrier waver is by default 8KHz.
3	Have the pre-heat function enabled right after power-on: Have the related parameters pre-set including the MI terminal.
4	Pre-heat function won't be enabled right away without setting up MI=26 even when related parameters are set up. In this case, press RUN on the keypad to enable pre-heating.
5	When level of pre-heat DC current =0, there is no output.
6	When pre-heat DC current cycle time =0, there is no output.
7	(MI=26 ON). When MI = 9 [External Base Block], pre-heat function is disabled which means no output. Once the external base block is turned off then the pre-heat function will be enabled.
8	(MFI=26 ON). When MI =16 [Output Shutoff Stop], pre-heat function is disabled which means no output. Once the MI= 16 is turned off then the pre-heat function will be enabled.
9	(MI=26 ON). If there is any error occurred on the motor drive, pre-heat function is disabled which means no output. But if MI =26 is ON, the pre-heat function will be re-enabled after the error is cleared.

### Notes on Multi-function Output Terminals:

1	During pre-heat cycle, if MO=1 [AC Drive operational], there will be output from relay.
2	During pre-heat cycle, if Mo=3 [Zero speed], there will be output from relay.

### Availability

Version	Series number	
v1.130	WJ	W1535

## 2.8 NEW – User manual for VFD-EL

A new user manual for VFD-EL has been released:  
[DELTA\\_IA-MDS\\_VFD-EL\\_UM\\_EN\\_20150911.pdf](#) (5ELE)  
 You can find it on our ftp-site.

### 2.9 NEW – User manual for C200

A new user manual for C200 has been released:  
[DELTA\\_IA-MDS\\_C200\\_UM\\_EN\\_20150821.pdf](#) (5ELE)  
 You can find it on our ftp-site.

### 2.10 NEW –UT-14SS2-A and UT-12SE starter kits:



**UT-14SS2-A: For learning PLC and HMI programming.**

**Components:**



Item	Model name	Description
A	Starter Kit Manual	User manual
B	DVP-PS01	Power supply module, 24 V DC output
C	DVP14SS211R	CPU with 14 built-in I/O points
D	DOP-B07S410	HMI, 7" TFT LCD
E	UC-MS020-06A (2 m)	Communication cable for connecting an HMI to a PLC
F	UC-PRG020-12A (2 m)	Programming cable for a PLC
G	UC-PRG015-02A (1.5 m)	Programming cable for an HMI
H	3865259300	DC power cable
I	3081419700	RS-485 cable for connecting a PLC to an HMI
J	3534435700	Four screw locks for an HMI
K	5502577100	I/O simulator board
L	UT-USB01	USB flash drive

**UT-12SE: For learning PLC and HMI programming.**

**Components:**



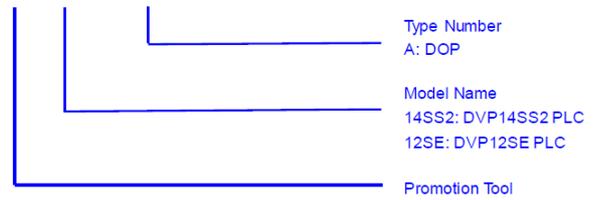
Item	Model name	Description
A	Starter Kit Manual	User manual
B	DVP-PS01	Power supply module, 24 V DC output
C	DVP12SE11R	CPU with 12 built-in I/O pints
D	DOP-B07E415	HMI, 7" TFT LCD
E	UC-PRG030-20A (3 m)	Ethernet cable
F	UC-PRG015-01A (1.5 m)	Programming cable for a PLC
G	UC-PRG015-02A (1.5 m)	Programming cable for an HMI
H	3865259300	DC power cable
I	3081419700	RS-485 cable for connecting a PLC to an HMI
J	3534435700	Four screw locks for an HMI
K	5502577101	I/O simulator board
L	UT-USB01	USB flash drive

### USB flash drive:

Item	Contents
<b>Software</b>	<ol style="list-style-type: none"> <li>ISPSofT</li> <li>COMMGR</li> <li>DOPSoft</li> <li>DCISofT</li> <li>UC-PRG020-12A driver</li> </ol>
<b>Manual</b>	<ol style="list-style-type: none"> <li>Starter Kit Manual</li> <li>ISPSofT User Manual</li> <li>DOPSoft User Manual</li> <li>DVP-ES2/EX2/SS2/SA2/SX2/SE&amp;TP Operation Manual - Programming</li> <li>DVP PLC Application Examples</li> <li>Instruction Sheet (DVPPS01/02/05)</li> <li>Instruction Sheet (DVP-SS2)</li> <li>Instruction Sheet (DVP-SE)</li> <li>Instruction Sheet (UC-PRG020-12A)</li> <li>Instruction Sheet (DOP-B07S410)</li> <li>Instruction Sheet (DOP-B07E415)</li> </ol>
<b>Program</b>	<ol style="list-style-type: none"> <li>HMI Element Example</li> <li>Examples (UT-14SS2-A)</li> <li>Examples (UT-12SE-A)</li> <li>DVP PLC Application Examples</li> </ol>

### Ordering information

#### UT - 14SS2 - A



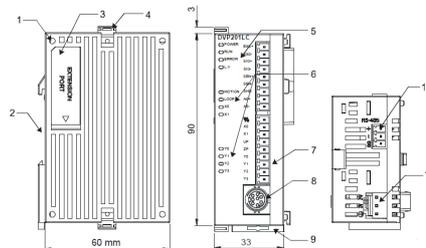
### Availability

Product name	Model	Date	Minimum quantity
Delta PLC Starter kit	UT-14SS2-A	2015/08	2
	UT-12SE-A		

## 2.11 NEW – DVP201LC-SL /DVP211LC-SL Load cells

Delta releases load cell modules which can be used to measure weights. They are DVP201LC-SL and DVP211LC-SL. DVP201LC-SL /DVP211LC-SL provides 24-bit resolution applicable for 4-wire or 6-wire load cells with various eigenvalues. Therefore, its response time can be adjusted according to users' needs. On this basis, the requirements of load application markets can be easily met.

	DVP201LC-SL	DVP211LC-SL
Communication interface	RS-232/RS-485	
Highest precision	0.04%	
Digital Filter	50/30/10/1/0.5/0.1Hz	
Adjust point	20	
Eigenvalue applicable to a load cell	0 ~ 1 · 0 ~ 2 · 0 ~ 4 · 0 ~ 6 · 0 ~ 20 · 0 ~ 40 and 0 ~ 80 mV/V	
Response time	2.5 · 10 · 16 · 20 · 50 · 60 · 100 · 200 and 400ms	
Sensibility	5 VDC	
Maximum distance for connecting a load cell	100M	
Applicable sensor type	4-wire or 6-wire load cell	
Load cell Channel	1	
Digital input *	X	2
Digital output *	X	4
Analog output *	X	1 (0~20mA Control)



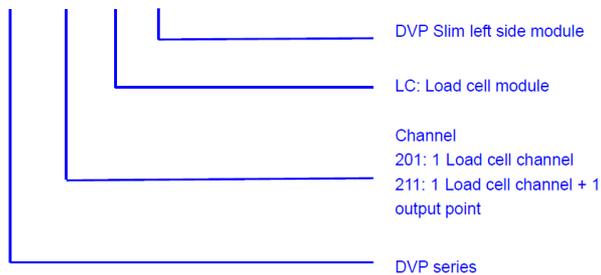
1. Mounting hole of the I/O module	2. DIN rail mounting slot (35mm)
3. I/O module connection port	4. I/O module clip
5. Status indicator (POWER, RUN, ERROR and L.V)	6. Function status indicators (MOTION, LOOP, DI (X0, X1)/DO(Y0-Y3))
7. I/O terminals	8. RS-232 port
9. Mounting slot clip	10. RS-485 port
11. DC power input	

### Specifications

Load cell module	Voltage output		
Rated supply voltage/Power consumption	24 V DC (-15 to +20%)/5 W		
Static minimum/maximum voltage	20.4 V/28.8 V DC		
Dynamic minimum/maximum voltage	18.5 V/30.2 V DC		
Maximum current consumption	150 mA		
Input signal range	±200 mV DC		
Sensibility	+5 V DC +/-5%		
ADC resolution	24 bits		
Highest precision	0.04%		
Communication interface	RS-232, RS-485		
Applicable sensor type	4-wire or 6-wire load cell		
Expanding a temperature coefficient	≤ ± 20 ppm/K v. E		
Reducing a temperature coefficient to zero	≤ ± 0.1 µV/K		
Linearity error	≤ 0.015%		
Response time	2.5, 10, 16, 20, 50, 60, 100, 200, and 400ms		
Eigenvalue applicable to a load cell	0~1, 0~2, 0~4, 0~6, 0~20 and 0~40 mV/V		
Maximum distance for connecting a load cell	100 meters		
Maximum output current	5 V DC * 300 mA		
Allowable load	40~4,010 Ω		
Averaging weights	100		
Common-mode rejection ratio (CMRR @50/60 Hz)	≥100 dB		
Isolation	Between a digital circuit and the ground: 500 V AC Between an analog circuit and the ground: 500 V AC Between an analog circuit and a digital circuit: 500 V AC		
Connecting to a DVP series PLC	Load cell modules can be connected to the left side of a PLC. The modules connected to a PLC are numbered from 100 to 107 according to the closeness to the PLC.		
Operation/Storage	Operation: 0~55°C (temperature), 5~95% (humidity), pollution degree 2 Storage: -25~70°C (temperature), 5~95% (humidity)		
Vibration/Shock resistance	International standards: IEC 61131-2, IEC 68-2-6 (TEST Fc)/IEC 61131-2 & IEC 68-2-27 (TEST Ea)		
	Electrical specifications for input terminals	Electrical specifications for output terminals	
Input/Output terminal	X0, X1	Y0, Y1, Y2, Y3	
Type	Digital input	Transistor	
Form	DC (sinking or sourcing)	--	
Specifications	Input current: 24 V DC, 5 mA	Voltage specifications: 5~30 V DC *1	
Input impedance	4.7 KΩ	--	
Maximum switch frequency	10 kHz	1 kHz	
Action level	Off → On	> 15 V DC	--
	On → Off	< 5 V DC	--
Response time	Off → On	< 20 µs	< 100 µs
	On → Off	< 50 µs	< 150 µs
Maximum load	Resistive load	--	0.5 A/output (4 A/COM) <sup>#2</sup>
	Inductive load	--	15 W (30 V DC)
	Bulb	--	2.5 W (30 V DC)

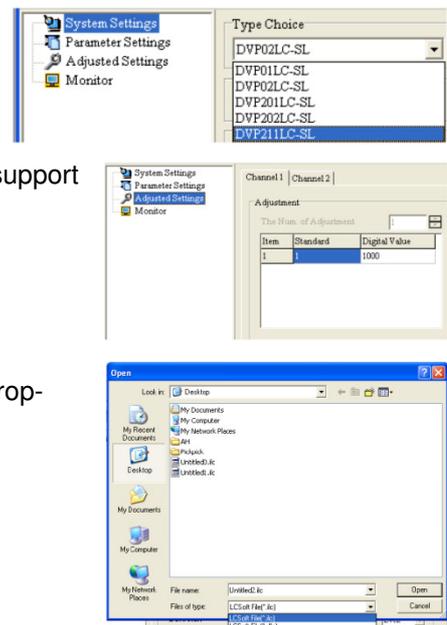
### Ordering information

#### DVP 201 LC - SL



### Software LCSOft 1.10

- If the operating system used by a user who is not an administrator in Windows 7 or above, the user can use the program normally.
- The two new models DVP201LC-SL, DVP211LC-SL are added. Some property settings for the new models are different from those for the old models DVP01LC-SL and DVP02LC-SL. Please refer to DVP201/211LC-SL Load Cell Module for more information.
- The adjustment flow is modified because the new models support the adjustment of multiple points.
- The filename extension “.ilc” is added to the Files of type drop-down list box in the Open window.



## 2.12 NEW – Delta Standard Power Supplies Catalogue

The October 2015 Edition of the Delta Standard Power Supplies catalogue is now available. You can find it on the ftp-site.

## 3 Application

### 3.1 NEW – Application Notes

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

- Agriculture industry Notification-Plant factory.pdf
- Electronics Industry Notification- Sapphire Multi-wire cutting machine.pdf
- Fluid Industry Notification -- Beam Pumping Unit Control Solution.pdf
- Machine Tool Notification- C-type Crankshaft Mechanical Pressing Machine.pdf
- Robot Industry Notification-Fluid dispensing Robot.pdf
- Electronics Industry Notification- COG Bonding Machine.pdf

- [Electronic Industry Notification - Automated IC Burning Machine.pdf](#)

## 4 FAQ

### 4.1 VFD-series AC Motor drives

#### C/CP2000

**Q Fan control: Can changing ID cause damage?**

**A** C/CP2000 Frame A,B have on/off fan control.  
Frame C and up have PWM fan control.

When the ID is (re)set on a Frame A,B drive to e.g. prepare the control board for a drive of Frame C and up, the fan control changes but it won't cause any damage.  
It can be that the fan on the Frame A,B drive doesn't work properly at that moment.

#### CP2000

**Q How to disable PID control in HAND mode?**

**A** In HAND mode PID control can be disabled by Bit2 of Pr00-28 (Firmware 1.21 and up)

✗ 00 - 28 Switching from Auto mode to Hand mode

Factory Setting: 0

Settings 0 - 65535

Bit0 : Sleep Function Control Bit

0: Cancel sleep function

1: Sleep function and Auto mode are the same

Bit1 : Unit of the Control Bit

0: Unit of the Control Bit

1: Same unit as the Auto mode

**Bit2 : PID Control Bit**

0: Cancel PID control

1: PID control and Auto mode are the same.

Bit3: Frequency Source Control Bit

0: Frequency command set by parameter, if multi-step speed is activate, then multi-step speed has the priority

1: Frequency command set by parameter 00-30

#### VFD-E

**Q How to reset VFD-E with a Modbus Multi-write instruction?**

**A** 01 10 2000 0003 06 0011 1388 0002 Doesn't allow to reset the drive, gives error message.  
01 10 2000 0003 06 0000 1388 0002 Allows to reset the drive.

#### C200

**Q How to activate encoder?**

**A** When 10-01~02 is set, MI7 & MI8 are automatically activated for encoder input.  
The original setting of MI7 & MI8 will be ignored.  
The encoder type must be 24V Open Collector.  
See also page 6-5 of the user manual (PG-Function Explanation).

#### VFD-L2

**Q What is the class and max motor length for VFD-L2?**

**A**



VFD-L2

For VFDxxxL21B/E the class is EN61800-3:2011 C2 with 10m shielded motor cable both for conducted and radiated emission.