



2012-05-23



5012613300 - L2S0

## VFD-L Series Instruction Sheet

### 1 Preface

Thank you for choosing DELTA's VFD-L series AC Drive. The VFD-L series is manufactured using high-quality components, material and incorporating the latest microprocessor technology available.

This manual will help in the installation, parameter setting, troubleshooting, and daily maintenance of the AC motor drive. To guarantee safe operation of the equipment, read the following safety guidelines before connecting power to the AC motor drive. Keep this operating manual handy and distribute to all users for reference.

#### Important Notes:

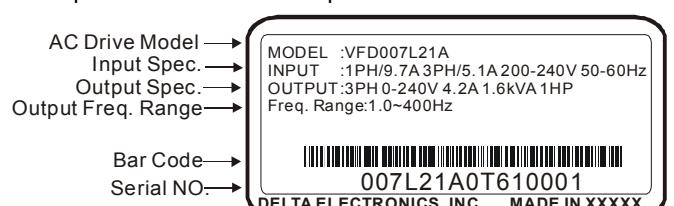
- DANGER** ➤ AC input power must be disconnected before any maintenance. Do not connect or disconnect wires while power is applied to the circuit. Only qualified technicians should perform maintenance on the VFD-L.
- A charge may still remain in the DC-link capacitor with hazardous voltages even after the power has been turned off. To avoid personal injury, do not remove the cover of the AC drive until all "DISPLAY LED" lights on the digital keypad are off. Please note that there are live components exposed when the AC drive is open. Be careful to not touch these live parts.
- The AC drive may be destroyed beyond repair if power is misapplied to the input/output terminals. Never connect the AC drive output terminals U/T1, V/T2, W/T3 directly to the AC main circuit power supply.
- There are highly sensitive MOS components on the printed circuit boards. These components are especially sensitive to static electricity. To avoid damaging these components, do not touch the circuit boards with metal objects or your bare hands.
- Ground the VFD-L using the ground terminal. The grounding method must comply with the laws of the country where the AC drive is to be installed.

### 2 Receiving and Inspection

This VFD-L AC drive has gone through rigorous quality control tests at the factory before shipment. Since many things may happen during shipping, please check for the following after receiving the AC motor drive.

- ◎ Inspect the unit to insure it was not damaged during shipment.
- ◎ Make sure that the part number indicated on the nameplate corresponds with the part number of your order.

#### Nameplate Information: Example of 1HP230V



#### Model Explanation

VFD 007 L 21 A  
 Version A: standard E: PNP Mode with EMI Filter  
 B: with EMI Filter W: customized  
 D: PNP Mode  
 Input voltage 11:115V 1-PHASE, 23:230V 3-PHASE  
 VFD-L series 21:230V 1-PHASE  
 Applicable motor capacity 002:0.2kW 007:0.75kW 022:2.2kW  
 004:0.4kW 015:1.5kW  
 Variable Frequency Drive

#### Serial Number Explanation

007L21A0 T 6 10 001  
 Production number  
 Production week  
 Production year 2006  
 T: Taoyuan W: Wujiang Production factory  
 230V 1-PHASE 1HP(0.75kW) Model

If there is any nameplate information not corresponding to your purchase order or any problem, please contact your distributor.

### Dimension

Figure 1

For models : VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21D, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD007L21E, VFD015L21W, VFD015L23A

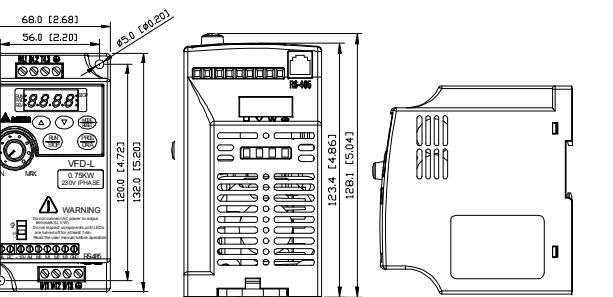
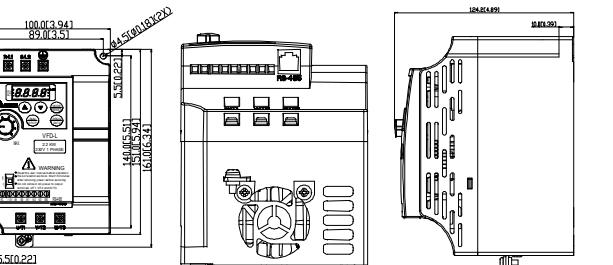


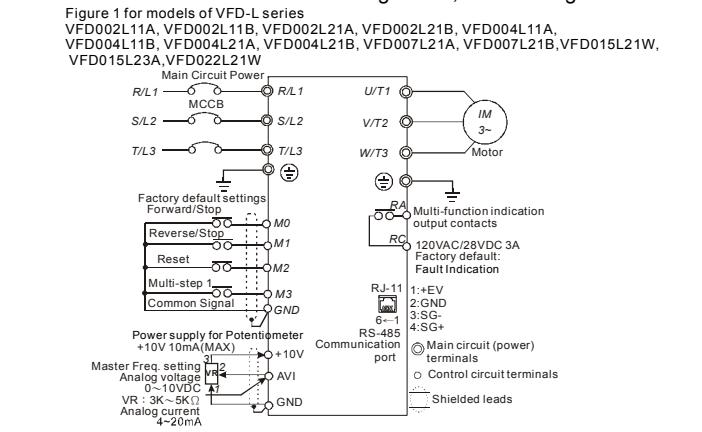
Figure 2  
For models : VFD022L21W



### 3 Wiring

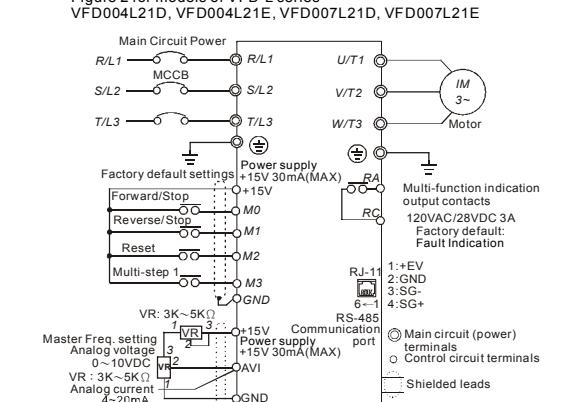
#### Basic Wiring Diagram

Users must connect wiring according to the circuit diagram shown below. Please follow all National and State wiring codes, when wiring the VFD-L.



NOTE: Do not plug in a Modem or telephone line to the RS-485 communication port, permanent damage may result. Terminals 1 & 2 are the power source for the optional copy keypad and should not be used while using RS-485 communication.  
 Model VFD015L21W uses power terminals S/L2 and T/L3.  
 If the AC Drive model is VFD002L11A/B, VFD004L11A/B, VFD002L21B, VFD004L21B or VFD007L21B, please use power terminals R/L1 and S/L2.  
 If the AC Drive model is VFD002L21A, VFD004L21A or VFD007L21A, 1-phase/3 phase power can be used on R/L1, S/L2, T/L3. When VFD002L21A/VFD004L21A or VFD007L21A uses 1-phase power, please select any two of the three input terminals R/L1, S/L2, T/L3.  
 If the AC Drive model is VFD015L23A, single phase power is not allowed.

Figure 2 for models of VFD-L series

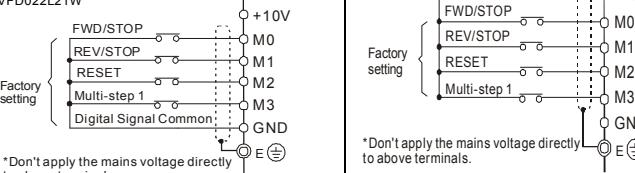


NOTE: Do not plug in a Modem or telephone line to the RS-485 communication port, permanent damage may result. Terminals 1 & 2 are the power source for the optional copy keypad and should not be used while using RS-485 communication.  
 If the AC Drive model is VFD004L21E, VFD007L21E, please use power terminals R/L1 and S/L2.  
 If the AC Drive model is VFD004L21D, VFD007L21D, 1-phase/3 phase power may be used on R/L1, S/L2, T/L3. When VFD004L21D/VFD007L21D use 1-phase power, please select any two of the three input terminals R/L1, S/L2, T/L3.

### Wiring for NPN mode and PNP mode

NPN Mode for models:

VFD002L11A, VFD002L11B, VFD002L21A, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21D, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD007L21E, VFD015L21W, VFD015L23A



Main circuit wiring

Figure 1

For models : VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21D, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD007L21E - VFD015L21W, VFD015L23A

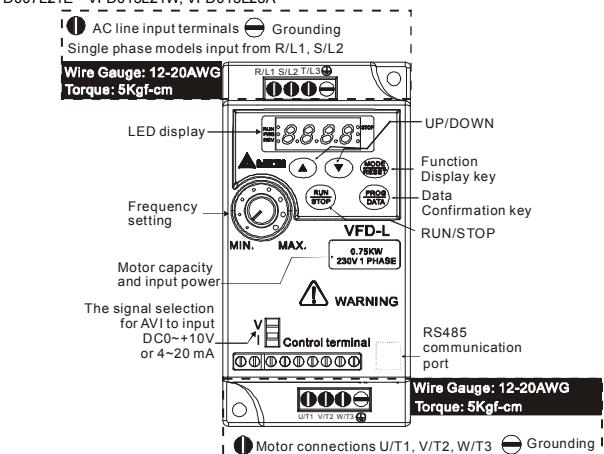
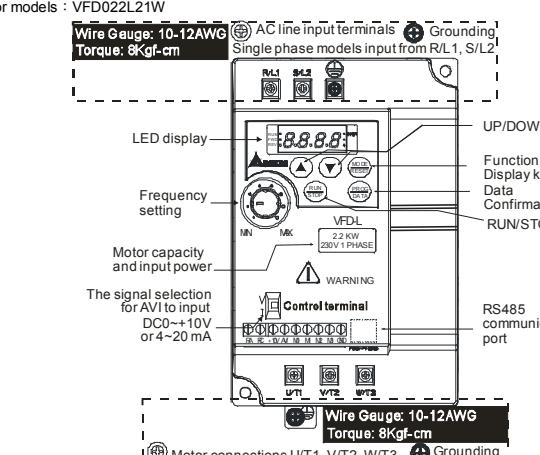


Figure 2  
For models : VFD022L21W



### Control circuit wiring

Figure 3 for models:

VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD007L21A, VFD007L21B, VFD015L21W, VFD015L23A

Wire Gauge: 10-12AWG, Torque: 4Kgf-cm

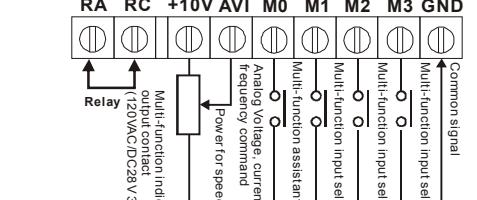
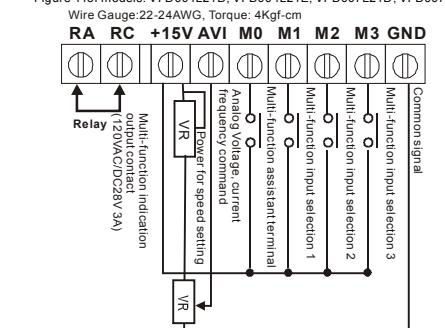


Figure 4 for models: VFD004L21D, VFD004L21E, VFD007L21D, VFD007L21E



### Wiring Notes: PLEASE READ PRIOR TO INSTALLATION.

**WARNING**

- Do not connect the AC input to any of the U/T1, V/T2, W/T3 terminals, as it will damage the AC drive.
- Ensure all screws are tightened to the proper torque rating.

1. During installation, follow all national and local electrical, construction, and safety codes for the country the drive is to be installed in.
2. Ensure the appropriate protective devices (circuit breaker or fuses) are connected between the power supply and AC drive.
3. Make sure that the leads are connected correctly and the AC drive is properly grounded. (Ground resistance should not exceed 0.1Ω.)
4. Use ground leads that comply with AWG/MCM standards and keep them as short as possible.
5. Multiple VFD-L units can be installed in one location. All the units should be grounded directly to a common ground terminal. The VFD-L ground terminals may also be connected in parallel, as shown in the figure below. Ensure there are no ground loops.



6. When the AC drive output terminals U/T1, V/T2, and W/T3 are connected to the motor terminals U, V, and W, respectively, the motor will rotate counterclockwise (as viewed from the shaft ends of the motor) when a forward operation command is received. To reverse the direction of motor rotation, switch over any of the two motor leads.
7. Make sure that the power is capable of supplying the correct voltage and required current to the AC drive.
8. Do not attach or remove wiring when power is applied to the AC drive.
9. Do not monitor the signals on the circuit board while the AC drive is in operation.
10. Route the power and control wires separately, or orthogonal to each other.
11. If a filter is required for reducing EMI (Electro-Magnetic Interference), install it as close as possible to AC drive. EMI can also be reduced by lowering the Carrier Frequency.
12. If the AC drive is installed in the place where a load reactor is needed, install the filter close to U/T1, V/T2, W/T3 side of AC drive. Do not use a Capacitor or L-C Filter (Inductance-Capacitance) or R-C Filter (Resistance-Capacitance).
13. When using a general GFCI (Ground Fault Circuit Interrupter), select a current sensor with sensitivity of 200mA or above, and not less than 0.1-second operation time to avoid nuisance tripping. For the specific GFCI of the AC motor drive, please select a current sensor with sensitivity of 30mA or above.

### 4 Summary of Parameters

**Group 0: User Parameters** ✓ The parameter may be set during operation.

Pr.	Functions	Settings	Factory Setting
0-00	Identity code of drive (Read only)	d1: 40W d2: 100W d3: 200W d4: 400W	d5: 750W d6: 1.5kW d7: 2.2kW
0-01	Rated current display (Read only)	40W: d0.4A 100W: d0.8A 200W: d1.6A 400W: d2.5A	750W: d4.2A 1.5kW: d7.0A 2.2kW: d11.0A
0-02	Parameter reset	d10: Reset Parameters to Factory Setting	d0
✓0-03	Start-up display of AC drive	d0: F (Frequency command) d1: H (output frequency) d2: U (user-defined unit) d3: A (output current)	d0
✓0-04	User-defined Unit	d0: Display User-Defined Unit (u) d1: Display Counter Value (C) d2: Display Process Operation (1=tt) (Display the current speed's step and the rest time for this step speed) d3: Display DC-BUS voltage (U) d4: Display output voltage (E)	d0
✓0-05	User-defined coefficient K	d0.1 ~ d160	d1.0
0-06	Software version	Read only	##
0-07	Password input	d0 ~ d999	d0
0-08	Password configuration	d0 ~ d999	d0

**Group 1: Basic Parameters**

Pr.	Functions	Settings	Factory Setting
1-00	Maximum operation Freq.	d50.0 ~ d400Hz	d60.0
1-01	Maximum		

Pr.	Functions	Settings	Factory Setting
1-18	S-curve setting in deceleration	d0 ~ d7	d0

#### Group 2: Operation Method Parameters

Pr.	Functions	Settings	Factory Setting
2-00	Source of frequency command	d0: Digital keypad d1: 0 ~ 10V from AVI d2: 4 ~ 20mA from AVI d3: Controlled by V.R on drive d4: RS-485 communication interface	d0
2-01	Source of operation command	d0: By digital keypad d1: By external terminals, keypad STOP enable d2: By external terminals, keypad d3: By RS-485 communication interface, keypad STOP enable d4: By RS-485 communication interface, keypad STOP disable	d0
2-02	Stop method	d0: Ramp stop d1: Coast stop	d0
2-03	Carrier freq.	d3 ~ d10K Hz	d10
2-04	Reverse operation inhibit	d0: Enable reverse d1: Disable reverse d2: Disable forward	d0
2-05	ACI (4 ~ 20mA) input loss detection	d0: Decel to 0Hz d1: Stop immediately, display EF d2: Run with the last freq.	d0
2-06	Line Start Lockout	d0: Enable d1: Disable	d0

#### Group 3: Output Function Parameters

Pr.	Functions	Settings	Factory Setting
3-00	Desired freq. attained	d1.0 ~ d400 Hz	d1.0
3-01	Terminal count value	d0 ~ d999	d0
3-02	Preliminary count value	d0 ~ d999	d0
3-03	Multi-function (relay output)	d0: not used d1: AC drive operational d2: Max. Output Freq. Attained d3: Zero Speed d4: Over Torque d5: Base-Block (B.B.) d6: Low Voltage Detection d7: AC Drive Operation Mode d8: Fault Indication d9: Desired Freq. Attained d10: PLC Program Running d11: PLC Program Step Complete d12: PLC Program Complete d13: PLC Program Operation Pause d14: Terminal Count Value Attained d15: Preliminary Count Value Attained d16: Ready State Indicator	d8

#### Group 4: Input Function Parameters

Pr.	Functions	Settings	Factory setting
✓4-00	Potentiometer bias freq.	d0.0~d350Hz	d0.0
✓4-01	Potentiometer bias polarity	d0: positive bias d1: negative bias	d0
✓4-02	Potentiometer freq. gain	d1~d200%	d100
4-03	Potentiometer reverse motion enable	d0: not used d1: reverse motion enable d2: forward motion only	d0
4-04	Multi-function input terminal1 (M1) (d 0~d 20)	d0: not used d1: M0: FWD/STOP, M1: REV/STOP d2: M0: RUN/STOP, M1: FWD/REV d3: M0, M1, M2: 3-wire operation control mode d4: External fault, normally open (N.O.) d5: External fault, normally closed (N.C.) d6: RESET d7: multi-step speed command 1 d8: multi-step speed command 2 d9: jog operation	d1
4-05	Multi-function input terminal 2(M2)	d10: accel/decel speed inhibit d11: first or second accel/decel time selection d12: base-block (B.B.), normally open (N.O.) d13: base-block (B.B.), normally closed (N.C.) d14: increase master freq. d15: decrease master freq. d16: run PLC program d17: pause PLC d18: counter trigger signal d19: counter reset d20: select ACI/deselect AVI	d6
4-06	Multi-function input terminal 3(M3) (d 0, d 4~d 20)		d7

#### Group 5: Multi-step Speed and PLC Parameters

Pr.	Functions	Settings	Factory Setting
5-00	1 <sup>st</sup> step speed freq.	d0.0 ~ d400Hz	d0.0
5-01	2 <sup>nd</sup> step speed freq.	d0.0 ~ d400Hz	d0.0
5-02	3 <sup>rd</sup> step speed freq.	d0.0 ~ d400Hz	d0.0
5-03	PLC mode	d0: Disable PLC operation d1: Execute one program cycle d2: Continuously execute program cycles d3: Execute one program cycle step by step (separate by STOP) d4: Continuously execute one program cycle step by step (separate by STOP)	d0
5-04	PLC forward/reverse motion	d0 ~ d15 (d0: Forward, d1: Reverse)	d0

5-05	Time duration step 0	d0 ~ d65500 Sec	d0
5-06	Time duration step 1	d0 ~ d65500 Sec	d0
5-07	Time duration step 2	d0 ~ d65500 Sec	d0
5-08	Time duration step 3	d0 ~ d65500 Sec	d0

#### Group 6: Protection Parameters

Pr.	Functions	Settings	Factory Setting
6-00	Over-Voltage Prevention Level	d0:disable d350~d410V	d390
6-01	Over-current Prevention Level	d0: disable d20~d200%	d170
6-02	Over-torque detection	d0:disable d1:enabled during constant speed operation and continues until the continuous limit is reached. d2:enabled during constant speed operation and halted after detection. d3:enabled during accel and continues before continuous output time limit is reached. d4:enabled during accel and halted after over-torque detection.	d0
6-03	Over-torque detection level	d30 ~ d200%	d150
6-04	Over-torque detection time	d0.1 ~ d10.0 Sec	d0.1
6-05	Electronic thermal overload relay	d0: Not used d1: Act with standard motor d2: Act with special motor	d0
6-06	Electronic thermal characteristic	d30~d600 Sec	d60
6-07	Present fault record	d0: No fault occurred d1: oc (over current) d2: ov (over voltage) d3: oH (over heat) d4: oL (over load) d5: ol.1 (electronic thermal)	d0
6-08	Second most recent fault record	d0: ov (over voltage) d1: oH (over heat) d2: oL (over load)	
6-09	Third most recent fault record	d0: ol.1 (electronic thermal) d1: EF (external fault) d2: Reserved	
6-10	Forth most recent fault record	d0: Reserved d1: EF (external fault) d2: Reserved	
6-11	Fifth most recent fault record	d0: Reserved d1: EF (external fault) d2: Reserved	
6-12	Sixth most recent fault record	d0: EF (external fault) d1: Reserved d2: Reserved d3: oCa (current exceed during acceleration) d4: ocd (current exceed during deceleration) d5: ocn (current exceed during steady state)	

#### Group 7: Motor Parameters

Pr.	Functions	Settings	Factory Setting
✓7-00	Motor rated current	d30~d120 %	d85
✓7-01	Motor no-load current	d0 ~ d90 %	d50
✓7-02	Torque compensation	d0 ~ d10	d1
✓7-03	Slip compensation	d0.0 ~ d10.0	d0.0

#### Group 8: Special Parameters

Pr.	Functions	Settings	Factory Setting
8-00	DC braking voltage level	d0 ~ d30%	d0
8-01	DC braking time during start-up	d0.0 ~ d60.0 Sec	d0.0
8-02	DC braking time during stopping	d0.0 ~ d60.0 Sec	d0.0
8-03	Start-point for DC braking	d0.0 ~ d400.0 Hz	d0.0
8-04	Momentary power loss	d0: Stop operation after momentary power loss. d1: Continues after momentary power loss, speed search starts with master freq. d2: Continues after momentary power loss, speed search starts with min. output freq.	d0
8-05	Max. allowable power loss time	d0.3 ~ d5.0 Sec	d2.0
8-06	B.B. time for speed search	d0.3~d5.0 Sec	d0.5
8-07	Max. speed search current level	d30~d200%	d150
8-08	Skip freq. 1 upper bound	d0.0~d400 Hz	d0.0
8-09	Skip freq. 1 lower bound	d0.0~d400 Hz	d0.0
8-10	Skip freq. 2 upper bound	d0.0~d400 Hz	d0.0
8-11	Skip freq. 2 lower bound	d0.0~d400 Hz	d0.0
8-12	Skip freq. 3 upper bound	d0.0~d400 Hz	d0.0
8-13	Skip freq. 3 lower bound	d0.0~d400 Hz	d0.0
8-14	Auto restart after fault	d0~d10	d0
8-15	AVR function	d0: AVR function enable d1: AVR function disable d2: AVR function disable when decel	d2
8-16	Dynamic braking voltage	d350 ~ d450V	d380
8-17	DC braking lower bound limit	d0.0 ~ d400 Hz	d0.0

#### Group 9: Communication Parameters

Pr.	Functions	Settings	Factory Setting
✓9-00	Communication address	d1 ~ d247	d1
✓9-01	Transmission speed	d0: Baud rate 4800 d1: Baud rate 9600 d2: Baud rate 19200	d1
✓9-02	Transmission fault treatment	d0: Warn and continue running d1: Warn and ramp to stop d2: Warn and coasting stop d3: No warn and keep running	d0
✓9-03	Modbus communication watchdog timer	d0: Disable d1~d20: 1 ~ 20 Sec	d0

Pr.	Functions	Settings	Factory Setting
✓9-04	Communication protocol	<b>ASCII mode</b> d4: 8,E,1 d5: 8,O,1 <b>RTU mode</b> d0: 7,N,2 d1: 7,E,1 d2: 7,O,1 d3: 8,N,2 d4: 8,O,1	d0

#### 5 Troubleshooting and Fault Information

The VFD-L AC drive has a comprehensive fault diagnostic system that includes several different alarms and fault messages. Once a fault is detected, the corresponding protective functions will be activated. The following faults are displayed on the AC drive digital keypad. The six most recent faults can be read on the digital keypad display by viewing Pr.6-07 to Pr.6-12. NOTE: faults can be cleared by pressing the Reset key on the keypad or Input Terminal.

#### Common Problems and Solutions

Fault Name	Fault Descriptions	Corrective Actions	
✓F1	Auto accel/decel failure	Don't use the	



2012-05-23



5012613300-L2S0

## VFD-L 系列說明書

### 1 序言

感謝您採用台達高性能、簡易型交流馬達驅動器 VFD-L 系列。VFD-L 係列採用高品質之元件、材料及融合最新的微電腦控制技術製造而成。本手冊提供給使用者安裝、參數設定、異常診斷、排除及日常維護本交流馬達驅動器相關注意事項。為了確保能夠正確地安裝及操作本交流馬達驅動器，請在裝機之前，詳細閱讀本使用手冊，並請妥善保存及交由該機器的使用者。以下為特別需要注意的事項：



- 在交流馬達驅動器內部的電子元件對靜電特別敏感，因此不可將異物置入交流馬達驅動器內部或觸摸主電路板。
- 切斷交流電源後，交流馬達驅動器數位操作器指示燈未熄滅前，表示交流馬達驅動器內部仍有高壓十分危險，請勿觸摸內部電路及零組件。
- 絶不可將交流馬達驅動器輸出端子 U/T1, V/T2, W/T3 連接至 AC 電源。
- 實施配線，務必關閉電源。
- 交流馬達驅動器端子  $\oplus$  態必正確的接地。

### 2 交貨檢查

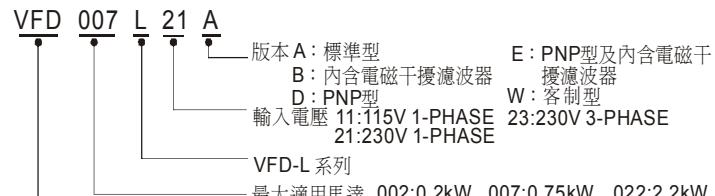
每部 VFD-L 交流馬達驅動器在出廠前，均經嚴格之品管，並做強化之防撞包裝處理。客戶在交流馬達驅動器拆箱後，請即刻進行下列檢查步驟。

- ◎ 檢查交流馬達驅動器是否在運輸過程中造成損傷。
- ◎ 拆封後檢查交流馬達驅動器機種型號是否與外箱登錄資料相同。

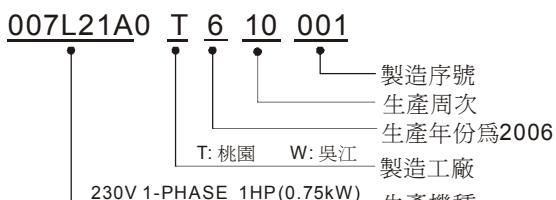
#### 銘牌說明：以 1HP230V 為例



#### 型號說明



#### 序號說明

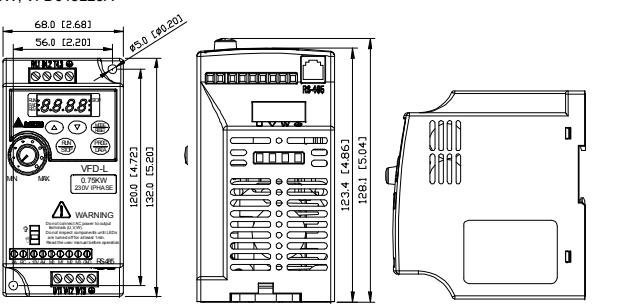


如有任何登錄資料與您訂貨資料不符或產品有任何問題，請您與接洽之代理商或經銷商連絡。

#### 外觀尺寸

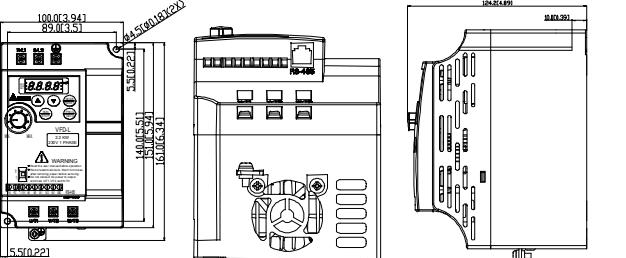
##### 外觀尺寸圖一

適用機種：VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD007L21E, VFD015L21W, VFD015L23A



##### 外觀尺寸圖二

適用機種：VFD022L21W

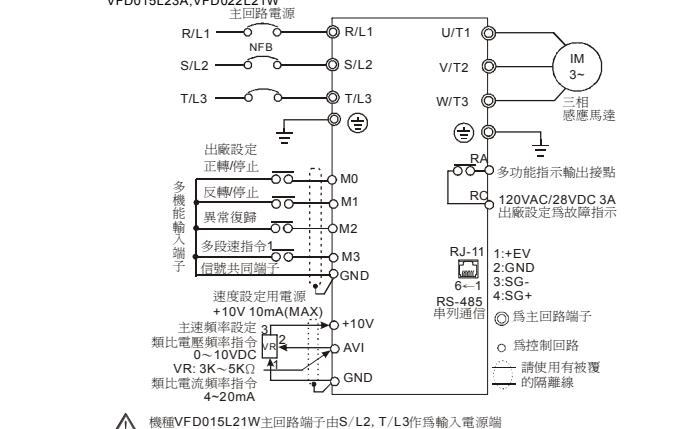


### 3 配線

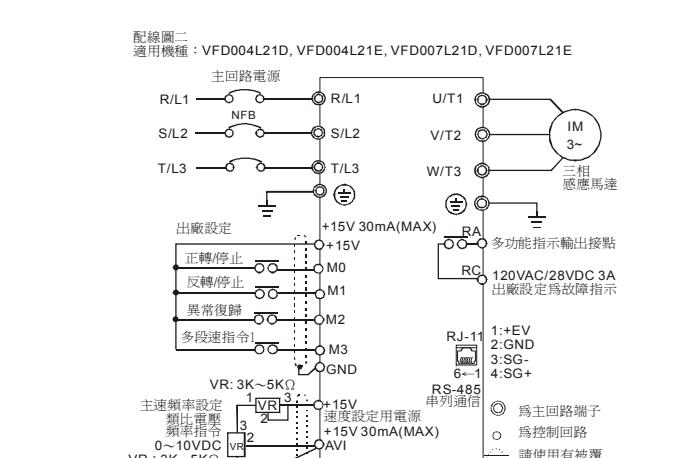
#### 基本配線圖

交流馬達驅動器配線部份，分為主回路及控制回路。用戶必須依照下列之配線回路確實連接。下圖為 VFD-L 出廠時交流馬達驅動器的標準配線圖。若僅用數位控制面板操作時，只有主回路端子配線。

配線圖一  
適用機種：VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD015L21W, VFD022L21W



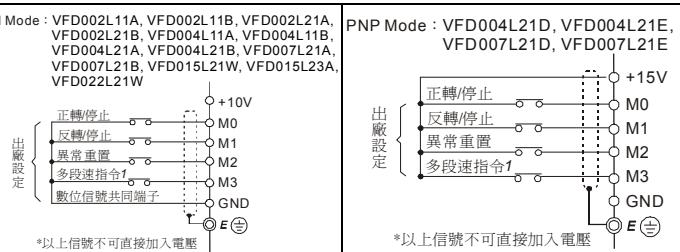
配線圖二  
適用機種：VFD004L21D, VFD004L21E, VFD007L21D, VFD007L21E



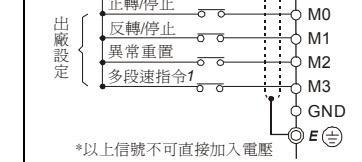
\* 若為單相機種VFD002L21E, VFD004L21E則主回路端子由R/L1 / S/L2作為輸入電源端。  
\* 標準型單相機種VFD004L21D 或 VFD007L21D 可輸入三相電源當使用單相電源時，輸入電源端可從輸入端子R/L1, S/L2, T/L3任選兩個。

#### NPN 模式及 PNP 模式的接線

NPN Mode : VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD015L21W, VFD022L21W



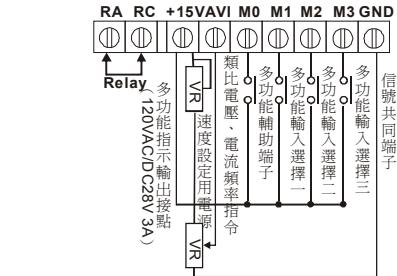
PNP Mode : VFD004L21D, VFD004L21E, VFD007L21D, VFD007L21E



\*以上信號不可直接加入電壓

適用機種 : VFD004L21D, VFD004L21E, VFD007L21D, VFD007L21E

端子台規格 : 扭力 : 5Kgf-cm, 線徑 : No.10-22AWG, 種類 : Copper



#### 配線注意事項

➤ 請勿連接 AC 輸入至 U/T1, V/T2, W/T3 任一端子以避免造成變頻器損壞。

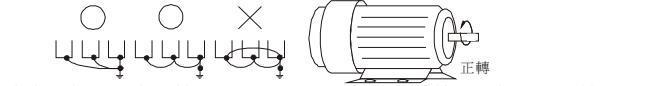
■ 配線時，配線線徑規格之選定，請依照电工法規之規定施行配線，以策安全。

■ 三相交流輸入電源與主回路端子(R/L1, S/L2, T/L3)之間的連線一定要接一個無熔絲開關及保險絲。最好能另串接一電磁接觸器(MC)以在交流電機驅動器保護功能動作時可同時切斷電源。(電磁接觸器的兩端需加裝 R-C 突波吸收器)。

■ 輸入電源 R/L1, S/L2, T/L3 並無相序分別，可任意連接使用；接地端子  $\ominus$  以第三種接地方式接地。(接地阻抗 100Ω 以下)

■ 交流馬達驅動器接地線不可與電線、大馬力馬達等大電流負載共同接地，而必須分別接地。接地配線必須愈短愈好。

■ 數台交流馬達驅動器共同接地時，勿形成接地回路。參考下圖：



■ 若將交流馬達驅動器輸出端子 U/T1, V/T2, W/T3 相對連接至馬達 U,V,W 端子，則交流馬達驅動器數位控制面板上正轉(FWD)指示燈亮，則表示交流馬達驅動器執行正轉，馬達轉向如上右圖所示；若逆轉(REV)指示燈亮，則表示交流馬達驅動器執行反轉，轉向與上圖相反。若無法確定交流馬達驅動器輸出端子 U/T1, V/T2, W/T3 連接至馬達 U,V,W 端子是否一對一連接，如果交流馬達驅動器執行正轉時，馬達為反轉方向，只要將馬達 U,V,W 端子中任意兩條對調即可。確定供電電源系統的電壓及可供應之最大容量。

■ 當「數位操作器」顯示時，請勿連接或拆卸任何配線。

■ 請將減速時間加長以避免驅動器跳過電壓保護。

■ 不可將交流電源連接至交流馬達驅動器出力側端子 U/T1, V/T2, W/T3。

■ 主回路端子的螺絲請確實鎖緊，以防止因震動鬆脫產生火花。

■ 主回路與控制回路的配線必需分離，以防止發生誤動作。如必需交錯請作成 90°的交叉。

■ 若交流馬達驅動器出力側端子 U/T1, V/T2, W/T3 有必要加裝雜訊濾波器時，必需使用電容式 L-濾波器，不可加裝相電容器或 L-C、R-C 式濾波器。

■ 控制配線請儘量使用隔離線，端子前的隔離網剝除段請勿露出。

■ 電源配線請使用隔離線或線管，並將隔離層或線管兩端接地。

■ 如果交流馬達驅動器的安裝場所對干擾相當敏感，則請加裝RFI濾波器，安裝位置離交流馬達驅動器越近越好。PWM的載波頻率越低，干擾也越少。

■ 交流馬達驅動器若有加裝一般漏電斷路器以作為漏電故障保護時，為防止漏電斷路器誤動作，請選擇感度電流在 200mA 以上，動作時間為 0.1 秒以上者。使用交流馬達驅動器專用漏電斷路器時，請選擇感度電流在 30mA 以上。

### 4 參數一覽表

#### 用戶參數0

參數	參數功能	設定範圍	出廠值
0-00	機種識別 (僅供讀取)	d1 : 40W d2 : 750W d3 : 200W d4 : 400W	工廠設定
0-01	額定電流顯示 (僅供讀取)	40W : d0.4A 100W : d0.8A 200W : d1.6A 400W : d2.5A	工廠設定
0-02	參數重置設定	d10 : 參數回復工廠設定	d0
0-03	開機顯示	d0 : F (頻率指令) d2 : U (使用者定義) d1 : H (輸出頻率) d3 : A (輸出電流)	d0
0-04	定義多功顯示內容	d0 : 顯示使用者定義(u) d1 : 顯示計數內容(C) d2 : 顯示程序運轉內容(1=t1) (顯示目前運轉的段數及該段剩餘的運轉時間) d3 : 顯示 DC-BUS 電壓(U) d4 : 顯示輸出電壓(E)	d0
0-05	使用者定義比例設定	d0.1 ~ d160	d1.0
0-06	軟體版本	僅能讀取	#.#
0-07	參數保護解碼輸入	d0 ~ d999 d1 : 參數已被鎖定	d0
0-08	參數保護密碼輸入	d0 ~ d999 d1 : 密碼已設定成功	d0

## 基本參數 1

參數	參數功能	設定範圍	出廠值
1-00	最大操作頻率	d50.0~d400Hz	d60.0
1-01	最大頻率設定	d10.0~d400Hz	d60.0
1-02	最大輸出電壓設定	d2.0~d255V	d220
1-03	中間頻率設定	d1.0~d400Hz	d1.0
1-04	中間電壓設定	d2.0~d255V	d12.0
1-05	最低輸出頻率設定	d1.0~d60.0Hz	d1.0
1-06	最低輸出電壓設定	d2.0~d255V	d12.0
1-07	上限頻率	d1~d110%	d100
1-08	下限頻率	d0~d100%	d0.0
1-09	第一加速時間	d0.1~d600 Sec	d10.0
1-10	第一減速時間	d0.1~d600 Sec	d10.0
1-11	第二加速時間	d0.1~d600 Sec	d10.0
1-12	第二減速時間	d0.1~d600 Sec	d10.0
1-13	JOG 加速時間設定	d0.1~d600 Sec	d10.0
1-14	JOG 減速時間設定	d0.0~d600 Sec	d10.0
1-15	JOG 頻率設定	d1.0Hz~d400Hz	d6.0
1-16	自動加/減速設定	d0: 正常加/減速 d1: 自動加速;正常減速 d2: 正常加速;自動減速 d3: 自動加/減速 d4: 正常加速;自動減速時,減速中失速防止 d5: 自動加速;自動減速時,減速中失速防止	d0
1-17	加速 S 曲線設定	d0~d7	d0
1-18	減速 S 曲線設定	d0~d7	d0

## 操作方式參數 2

參數	參數功能	設定範圍	出廠值
2-00	主頻率輸入來源	d0: 由鍵盤輸入 d1: 由外部 AVI 輸入 0~10V d2: 由外部 AVI 輸入 4~20mA d3: 由面板上 V.R 控制 d4: 由 RS-485 通信界面輸入	d0
2-01	運轉指令來源	d0: 由鍵盤操作 d1: 由外部端子操作, 鍵盤 STOP 有效 d2: 由外部端子操作, 鍵盤 STOP 無效 d3: 由 RS-485 通信界面操作, 鍵盤 STOP 有效 d4: 由 RS-485 通信界面操作, 鍵盤 STOP 無效	d0
2-02	停車方式	d0: 以減速煞車方式停止 d1: 以自由運轉方式停止	d0
2-03	載波頻率設定	d3~d10K Hz	d10
2-04	反轉禁止	d0: 可反轉 d1: 禁止反轉 d2: 禁止正轉	d0
2-05	ACI (4~20mA)	d0: 減速至 0Hz d1: 立即停止顯示 EF d2: 以最後頻率運轉	d0
2-06	斷線處理	d0: 可運轉 d1: 不可運轉	d0
2-07	電源起動運轉鎖定	d0: 可運轉 d1: 不可運轉	d0

## 輸出功能參數 3

參數	參數功能	設定範圍	出廠值
3-00	任意到達頻率	d1.0~d400 Hz	d1.0
3-01	計數值到達設定	d0~d999	d0
3-02	指定計數值到達	d0~d999	d0
3-03	多機能輸出 (繼電器)	d0: 無功能 d1: 運轉中指示 d2: 設定頻率到達指示 d3: 零速中指示 d4: 過轉矩檢出指示 d5: 外部中斷(B.B.)指示 d6: 低電壓檢出指示 d7: 交流馬達驅動器運轉指令由外部端子控制時指示 d8: 故障指示 d9: 任意頻率到達指示 d10: 執行程序自動運轉時指示 d11: 一階段運轉完成指示 (只維持 0.5 秒) d12: 自動運轉完成指示 (只維持 0.5 秒) d13: 自動運轉暫停指示 d14: 設定計數到達指示 d15: 指定計數到達指示 d16: 驅動器準備完成 (送電後無異常指示)	d8

## 輸入功能參數 4

參數	參數功能	設定範圍	出廠值
4-00	類比輸入頻率偏壓	d0.0~d350Hz	d0.0
4-01	偏壓調整方向	d0: 正方向 d1: 負方向	d0
4-02	輸入頻率增益	d1~d200%	d100
4-03	負偏壓可反轉	d0: 無負偏壓 d1: 負偏壓可反轉 d2: 負偏壓不可反轉	d0
4-04	多功能輸入選擇一(M1)	d0: 無功能 (設定範圍 d 0 ~ d 20)	d1

4-05	多功能輸入選擇二(M2) (設定範圍 d0, d4 ~ d 20)	d2: M0: 運轉/停止, M1: 正轉/反轉 d3: M0,M1,M2: 三線式運轉控制 d4: E,F, 常開接點輸入 (N.O.)	d6
4-06	多功能輸入選擇三(M3) (設定範圍 d0, d4 ~ d 20)	d5: E,F, 常閉接點輸入 (N.C.) d6: RESET 指令 d7: 多段速指令一 d8: 多段速指令二 d9: 尺動頻率指令 d10: 加/減速禁止 d11: 第一、二加減速時間切換 d12: 外部中斷, 常開接點 (N.O.) 輸入 d13: 外部中斷, 常閉接點 (N.C.) 輸入 d14: 上頻率指令 (Up command) d15: 下頻率指令 (Down command) d16: 自動程序運轉執行 d17: 自動程序運轉暫停 d18: 計數器觸發信號輸入 d19: 計數器清除 d20: 選擇 ACI/取消 AVI	d7

## 多段速以及自動程序運轉參數 5

參數	參數功能	設定範圍	出廠值
5-00	第一段速	d0.0~d400Hz	d0.0
5-01	第二段速	d0.0~d400Hz	d0.0
5-02	第三段速	d0.0~d400Hz	d0.0
5-03	自動程序運轉模式	d0: 自動運行模式取消 d1: 自動運行一週期後停止 d2: 自動運行循環運轉 d3: 自動運行一週後停止 (STOP 間隔) d4: 自動運行循環運轉 (STOP 間隔)	d0
5-04	PLC 運轉方向	d0~d15 (d0: 正轉 d1: 反轉)	d0
5-05	PLC 第 0 段時間	d0~d65500 Sec	d0
5-06	PLC 第一段時間	d0~d65500 Sec	d0
5-07	PLC 第二段時間	d0~d65500 Sec	d0
5-08	PLC 第三段時間	d0~d65500 Sec	d0

## 保護參數 6

參數	參數功能	設定範圍	出廠值
6-00	過電壓失速防止動作電壓	d0: 無效 d350~d410V	d390
6-01	過電流失速防止準設定	d0: 無效 d20~d200%	d170
6-02	過轉矩檢出功能選擇	d0: 不檢測 d1: 定速運轉中過轉矩偵測,(OL2)繼續運轉 d2: 定速運轉中過轉矩偵測,(OL2)停止運轉 d3: 加速中過轉矩偵測,(OL2)繼續運轉 d4: 加速中過轉矩偵測,(OL2)停止運轉	d0
6-03	過轉矩檢出位準	d30~d200%	d150
6-04	過轉矩檢出時間	d0.1~d10.0 Sec	d0.1
6-05	電子熱電驛選擇	d0: 不動作 d1: 以標準馬達動作 d2: 以特殊馬達動作	d0
6-06	熱電驛作用時間	d30~d600 Sec	d60
6-07	最近第一異常記錄	d0: 無異常記錄	d0
6-08	最近第二異常記錄	d1: OC(過電流)	d0
6-09	最近第三異常記錄	d2: OV(過電壓)	d0
6-10	最近第四異常記錄	d3: OH(過熱)	d0
6-11	最近第五異常記錄	d4: OL(驅動器過載)	d0
6-12	最近第六異常記錄	d5: OL1(電子熱動電驛) d6: EF(外部異常) d7: Reserved(保留) d8: Reserved(保留) d9: OC(A)加速度過電流 d10: OCD(減速中過電流) d11: OCN(低速中過電流)	d0

## 特殊參數 7

參數	參數功能	設定範圍	出廠值
#7-00	電機滿載電流	d30~d120%	d85
#7-01	電機無載電流	d0~d90%	d50
#7-02	轉矩補償	d0~d10	d1
#7-03	轉差補償	d0.0~d10.0	d0.0

## 高功能參數 8

參數	參數功能	設定範圍	出廠值
8-00	直流制動電壓準位	d0~d30%	d0
8-01	啓動時直流制動時間	d0.0~d60.0 Sec	d0.0
8-02	停止時直流制動時間	d0.0~d60.0 Sec	d0.0
8-03	直流制動的起始頻率	d0.0~d400.0 Hz	d0.0
8-04	瞬間停電再啓動	d0: 瞬間停電後不繼續運轉 d1: 瞬間停電後繼續運轉, 由停電後頻率往下追蹤 d2: 瞬間停電後繼續運轉, 由停電後頻率往上追蹤	d0
8-05	允許停電時間	d0.3~d5.0 Sec	d2.0
8-06	速度追蹤 B.B 時間	d0.3~d5.0 Sec	d0.5
8-07	速度追蹤最大電流	d30~d200%	d150

參數	參數功能	設定範圍	出廠值
8-08	禁止設定頻率 1 上限	d0.0~d400 Hz	d0.0
8-09	禁止設定頻率 1 下限	d0.0~d400 Hz	d0.0
8-10	禁止設定頻率 2 上限	d0.0~d400 Hz	



## 基本参数 1

参数	参数功能	设定范围	出厂值
1-00	最大操作频率	d50.0~d400Hz	d60.0
1-01	最大频率设定	d10.0~d400Hz	d60.0
1-02	最大输出电压设定	d2.0~d25V	d220
1-03	中间频率设定	d1.0~d400Hz	d1.0
1-04	中间电压设定	d2.0~d25V	d12.0
1-05	最低输出频率设定	d1.0~d60.0Hz	d1.0
1-06	最低输出电压设定	d2.0~d25V	d12.0
1-07	上限频率	d1~d110%	d100
1-08	下限频率	d0~d100%	d0.0
1-09	第一加速时间	d0.1~d600 Sec	d10.0
1-10	第一减速时间	d0.1~d600 Sec	d10.0
1-11	第二加速时间	d0.1~d600 Sec	d10.0
1-12	第二减速时间	d0.1~d600 Sec	d10.0
1-13	JOG 加速时间设定	d0.1~d600 Sec	d10.0
1-14	JOG 减速时间设定	d0.0~d600 Sec	d10.0
1-15	JOG 频率设定	d1.0Hz~d400Hz	d6.0
1-16	自动加/减速设定	d0: 正常加/减速 d1: 自动加速; 正常减速 d2: 正常加速; 自动减速 d3: 自动加/减速 d4: 正常加速; 自动减速时, 减速中失速防止 d5: 自动加速; 自动减速时, 减速中失速防止	d0
1-17	加速 S 曲线设定	d0~d7	d0
1-18	减速 S 曲线设定	d0~d7	d0

## 操作方式参数 2

参数	参数功能	设定范围	出厂值
2-00	主频率输入来源	d0: 由键盘输入 d1: 由外部 AVI 输入 0~10V d2: 由外部 AVI 输入 4~20mA d3: 由面板上 VR 控制 d4: 由 RS-485 通信界面输入	d0
2-01	运转指令来源	d0: 由键盘操作 d1: 由外部端子操作, 键盘 STOP 有效 d2: 由外部端子操作, 键盘 STOP 无效 d3: 由 RS-485 通信界面操作, 键盘 STOP 有效 d4: 由 RS-485 通信界面操作, 键盘 STOP 无效	d0
2-02	停车方式	d0: 以减速煞车方式停止 d1: 以自由运转方式停止	d0
2-03	载波频率设定	d3~d10K Hz	d10
2-04	反转禁止	d0: 可反转 d1: 禁止反转 d2: 禁止正转	d0
2-05	ACI (4~20mA) 断线处理	d0: 减速至 0Hz d1: 立即停止显示 EF d2: 以最后频率运转	d0
2-06	电源起动运转锁定	d0: 可运转 d1: 不可运转	d0

## 输出功能参数 3

参数	参数功能	设定范围	出厂值
3-00	任意到达频率	d1.0~d400 Hz	d1.0
3-01	计数值到达设定	d0~d999	d0
3-02	指定计数值到达	d0~d999	d0
3-03	多机能输出 (继电器)	d0: 无功能 d1: 运转中指示 d2: 设定频率到达指示 d3: 零速中指示 d4: 过转矩检出指示 d5: 外部中断 (B.B.) 指示 d6: 低电压检出指示 d7: 交流电机驱动器运转指令由外部端子控制时指示 d8: 故障指示 d9: 任意频率到达指示 d10: 执行程序自动运转时指示 d11: 一阶段运转完成指示 (只维持 0.5 秒) d12: 自动运转完成指示 (只维持 0.5 秒) d13: 自动运转暂停指示 d14: 设定计数到达指示 d15: 指定计数到达指示 d16: 驱动器准备完成 (送电后无异常指示)	d8

## 输入功能参数 4

参数	参数功能	设定范围	出厂值
4-00	类比输入频率偏压	d0.0~d350Hz	d0.0
4-01	偏压调整方向	d0: 正方向 d1: 负方向	d0
4-02	输入频率增益	d1~d200%	d100
4-03	负偏压可反转	d0: 无负偏压 d1: 负偏压可反转 d2: 负偏压不可反转	d0
4-04	多功能输入选择一(M1) (设定范围 d 0~d 20)	d0: 无功能 d1: M0: 正转/停止, M1: 反转/停止	d1

4-05	多功能输入选择二(M2) (设定范围 d 0, d 4~d 20)	d2: M0: 运转/停止, M1: 正转/反转 d3: M0,M1,M2: 三线式运转控制 d4: E,F, 常开接点输入 (N.O.) d5: E,F, 常闭接点输入 (N.C.)	d6
4-06	多功能输入选择三(M3) (设定范围 d 0, d 4~d 20)	d6: RESET 指令 d7: 多段速指令一 d8: 多段速指令二 d9: 寸动频率指令 d10: 加/减速禁止 d11: 第一、二加减速时间切换 d12: 外部中断, 常开接点 (N.O.) 输入 d13: 外部中断, 常闭接点 (N.C.) 输入 d14: 上频率指令 (Up command) d15: 下频率指令 (Down command) d16: 自动程序运转执行 d17: 自动程序运转暂停 d18: 计数器触发信号输入 d19: 计数器清除 d20: 选择 ACI/取消 AVI	d7

## 多段速以及自动程序运转参数 5

参数	参数功能	设定范围	出厂值
5-00	第一段速	d0.0~d400Hz	d0.0
5-01	第二段速	d0.0~d400Hz	d0.0
5-02	第三段速	d0.0~d400Hz	d0.0
5-03	自动程序运转模式	d0: 自动运行模式取消 d1: 自动运行一周后停止 d2: 自动运行循环运转 d3: 自动运行一周后停止 (STOP 间隔) d4: 自动运行循环运转 (STOP 间隔)	d0
5-04	PLC 运转方向	d0~d15 (d0: 正转 d1: 反转)	d0
5-05	PLC 第 0 段时间	d0~d65500 Sec	d0
5-06	PLC 第一段时间	d0~d65500 Sec	d0
5-07	PLC 第二段时间	d0~d65500 Sec	d0
5-08	PLC 第三段时间	d0~d65500 Sec	d0

## 保护参数 6

参数	参数功能	设定范围	出厂值
6-00	过电压失速防止动作电压	d0: 无效 d350~d410V	d390
6-01	过电流失速防止位准设定	d0: 无效 d20~d200%	d170
6-02	过转矩检出功能选择	d0: 不检测 d1: 定速运转中过转矩侦测, (oL2) 继续运转 d2: 定速运转中过转矩侦测, (oL2) 停止运转 d3: 加速中过转矩侦测, (oL2) 继续运转 d4: 加速中过转矩侦测, (oL2) 停止运转	d0
6-03	过转矩检出位准	d30~d200%	d150
6-04	过转矩检出时间	d0.1~d10.0 Sec	d0.1
6-05	电子热电驿选择	d0: 不动作 d1: 以标准电机动作 d2: 以特殊电机动作	d0
6-06	热电驿作用时间	d30~d600 Sec	d60
6-07	最近第一异常记录	d0: 无异常记录	d0
6-08	最近第二异常记录	d1: oc (过电流)	d0
6-09	最近第三异常记录	d2: ov (过电压)	d0
6-10	最近第四异常记录	d3: oH (过热)	d0
6-11	最近第五异常记录	d4: oL (驱动器过载)	d0
6-12	最近第六异常记录	d5: oL1 (电子热电驿) d6: EF (外部异常) d7: Reserved (保留) d8: Reserved (保留) d9: oca (加速中过电流) d10: ocd (减速中过电流) d11: ocn (恒速中过电流)	d0

## 特殊参数 7

参数	参数功能	设定范围	出厂值
#7-00	电机满载电流	d30~d120%	d85
#7-01	电机无载电流	d0~d90%	d50
#7-02	转矩补偿	d0~d10	d1
#7-03	转差补偿	d0.0~d10.0	d0.0

## 高功能参数 8

参数	参数功能	设定范围	出厂值
8-00	直流制动电压准位	d0~d30%	d0
8-01	启动时直流制动时间	d0.0~d60.0 Sec	d0.0
8-02	停止时直流制动时间	d0.0~d60.0 Sec	d0.0
8-03	直流制动的起始频率	d0.0~d400.0 Hz	d0.0
8-04	瞬间停电再启动	d0: 瞬间停电后不继续运转 d1: 瞬间停电后继续运转, 由停电后频率往下追踪 d2: 瞬间停电后继续运转, 由停电后频率往上追踪	d0
8-05	允许停电时间	d0.3~d5.0 Sec	d2.0
8-06	速度追踪 B.B 时间	d0.3~d5.0 Sec	d0.5
8-07	速度追踪最大电流	d30~d200%	d150

参数	参数功能	设定范围	出厂值
8-08	禁止设定频率 1 上限	d0.0~d400 Hz	d0.0
8-09	禁止设定频率 1 下限	d0.0~d400 Hz	d0.0
8-10	禁止设定频率 2 上限	d0.0~d400 Hz	d0.0
8-11	禁止设定频率 2 下限	d0.0~d400 Hz	d0.0
8-12	禁止设定频率 3 上限	d0.0~d400 Hz	d0.0
8-13	禁止设定频率 3 下限	d0.0~d400 Hz	d0.0
8-14	异常再启动次数	d0~d10 (允许异常状况: OC, OV)	d0
8-15	AVR 功能选择	d0: 有 AVR 功能 d1: 无 AVR 功能 d2: 减速时, AVR 功能取消	d2
8-16	DC-bus 烂车准位	d350~d450V	



# VFD-L Serisi Bilgi Dökümanı

## 1 Önsöz

DELTA VFD-L serisi AC Sürücülerini seçtiğiniz için teşekkürler. VFD-L serisi ürünler yüksek kaliteli komponent, materyal ve mevcut en yeni mikroişlemci teknolojisini kullanılarak üretilmektedir. Bu manual, AC motor sürücüsünün kurulumunu, parametre ayarını, arıza düzeltimi ve periyodik bakımı için kullanıcıya yardımcı olur. Cihazın güvenliğini sağlamak için, enerji vermeden önce aşağıdaki güvenlik uyarılarını dikkatlice okuyunuz. Bu uygulama manualını daha sonra referans olarak kullanmak için saklayınız.

### Önemi Notlar:

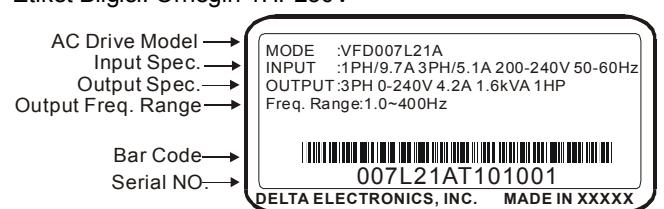
- DANGER** ➤ Bakım yapılmadan önce AC giriş power sökülmeli: Cihazda enerji varken kablo bağlantısı yapılmamalı veya kablo sökülmemelidir. VFD-L serisi cihazların bakımları yetkili teknisyenler tarafından yapılmalıdır.
- Enerji kesildikten sonra DC-link kondensatörler üzerinde yüksek voltaj kalır. Zarar görmemek için Keypad de bulunan "DISPLAY LED" üzerindeki bütün ışıklar sönenmeden cihaza müdahale etmeyin. Sürücük açıkkent cihazın tizerindeki yüksek voltaj taşıyan komponentlere dokunmayın.
- AC sürücü giriş/çıkış terminali bağlantıları doğru yapılmalıdır. Aksi takdirde cihaz zarar görebilir. AC besleme girişini kesinlikle U/T1, V/T2, W/T3 terminalerine doğrudan bağlamayınız.
- PCB üzerinde yüksek hassasiyetli MOS komponentler vardır. Bu komponentler özellikle statik elektrikye karşı duyarlıdır. Bu komponentlere zarar vermemez için kesinlikle metal nesnelerle veya çiplak elle dokunulmamalıdır.
- VFD-L sürücüsü üzerindeki ground terminalini kullanarak topraklayın. Topraklama metodu AC sürücünün kurulduğu ülke koşullarına uyumlu olmalıdır.

## 2 Ürünü Teslim Alma ve Kontrol

VFD-L serisi AC sürücüler gönderildiğinden önce fabrikada şiddetli kalite kontrol testlerinden geçirilmiştir. Nakliye sırasında oluşabilecek problemleri önlemek için, AC motor sürücüsünü alındıktan sonra lütfen aşağıdakiler kontrol ediniz.

- ◎ Nakliye sırasında ürüne zarar gelip geldiğini kontrol ediniz.
- ◎ Ürünün etiketi üzerinde yazan bilgilerin sırasıyla ettiğiniz ürün kodu ile aynı olduğunu kontrol ediniz.

Etket Bilgisi: Örneğin 1HP230V



### Model Açıklaması

VFD	007	L	21	A	Version
A:	standard	E:	PNP Mode with EMI Filter		
B:	with EMI Filter	W:	customized		
D:	PNP Mode				
Input voltage	11:115V 1-PHASE, 23:230V 3-PHASE				
VFD-L series					
Applicable motor capacity	002:0.2kW 007:0.75kW 022:2.2kW				
Variable Frequency Drive	004:0.4kW 015:1.5kW				

### Seri Numarası Açıklaması

T 6 10 001

- Production number
- Production week
- Production year 2006
- Production factory (T: Taoyuan, W: Wujuang)

Etketin üzerindeki bilgiler sırasıyla ettiğiniz ürünü karşılamıyorsa veya herhangi bir problem varsa lütfen firmamızla bağlantıya geçiniz.

## Ölüler

Figure 1  
For models : VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21D, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD007L21E, VFD015L21W, VFD015L23A

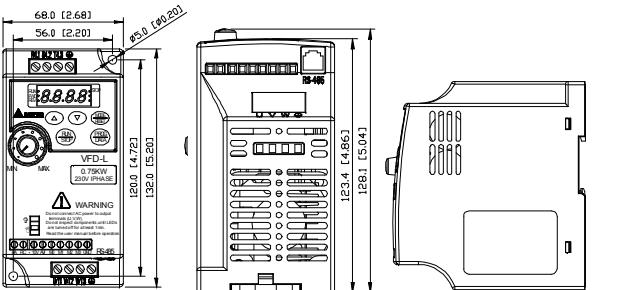
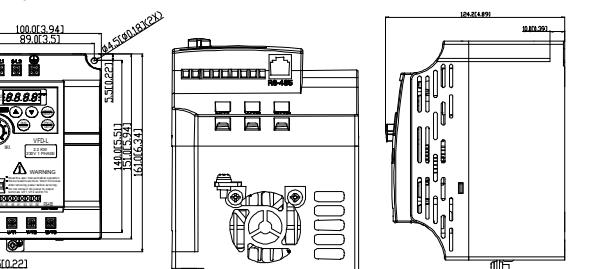


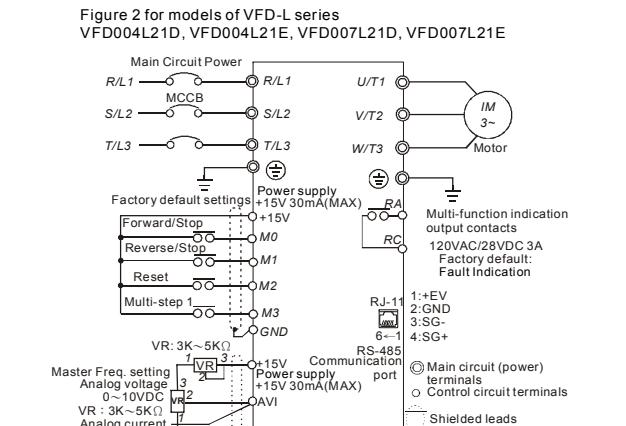
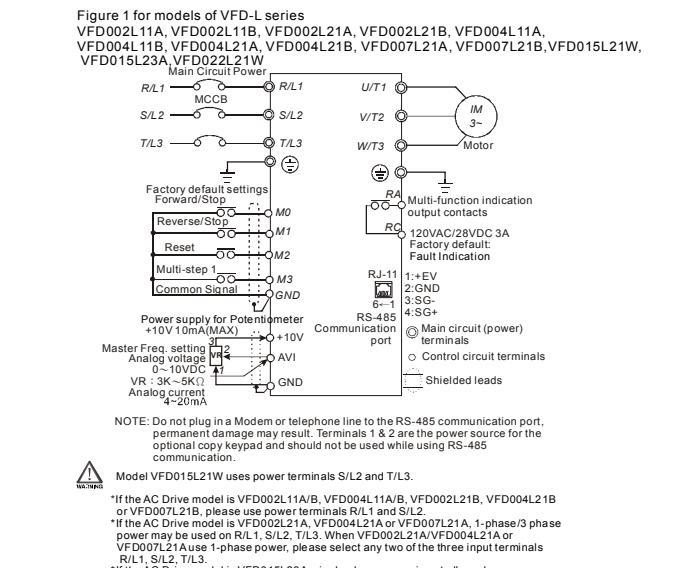
Figure 2  
For models : VFD022L21W



## 3 Bağlantı

### Temel Bağlantı Şeması

Kullanıcılar bağlantılarını aşağıdaki bağlantı şemasına göre yapmalıdır. VFD-L bağlantısı yapılırken lütfen ulusal bağlantı standartlarına göre bağlantıları yapınız.



Etketin üzerindeki bilgiler sırasıyla ettiğiniz ürünü karşılamıyorsa veya herhangi bir problem varsa lütfen firmamızla bağlantıya geçiniz.

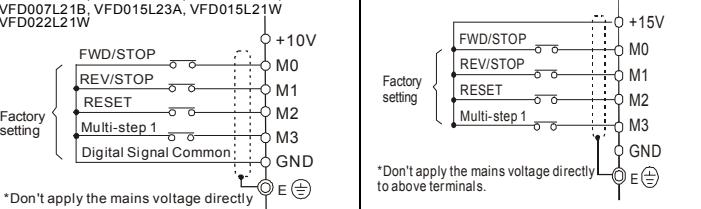
## NPN mod ve PNP mod Bağlantısı

NPN Mode for models:

VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21D, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD007L21E, VFD015L21W, VFD015L23A

PNP Mode for models:

VFD004L21D, VFD004L21E, VFD007L21D, VFD007L21E



## Ana Devre Bağlantısı

Figure 1

For models : VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21D, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD007L21E, VFD015L21W, VFD015L23A

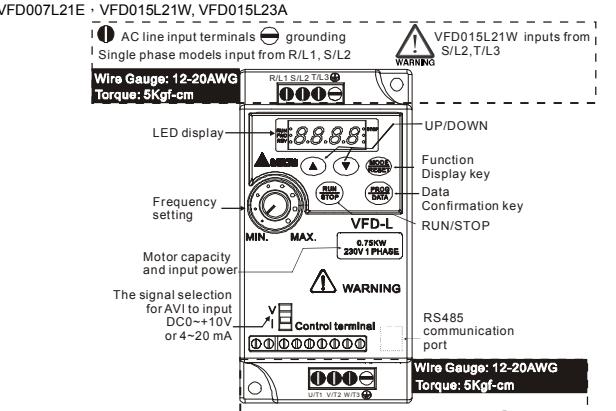
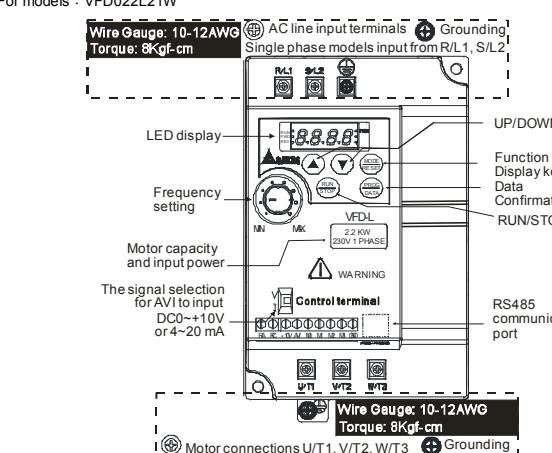


Figure 2

For models : VFD022L21W



## Kontrol Devresi Bağlantısı

Figure 3 for models: VFD002L11A, VFD002L11B, VFD002L21A, VFD002L21B, VFD004L11A, VFD004L11B, VFD004L21A, VFD004L21B, VFD004L21D, VFD004L21E, VFD007L21A, VFD007L21B, VFD007L21D, VFD007L21E, VFD015L21W, VFD015L23A, VFD022L21W

Wire Gauge: 10-12AWG, Torque: 8Kgf-cm

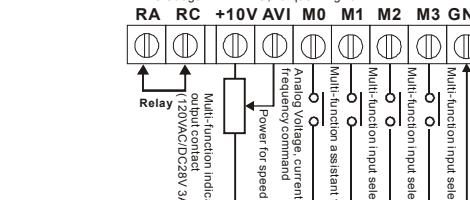
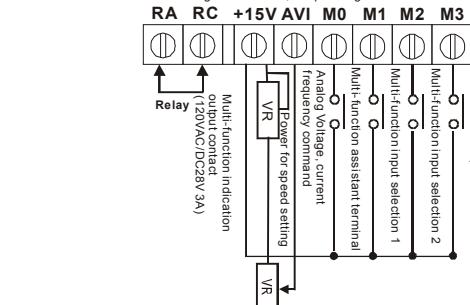


Figure 4 for models: VFD004L21D, VFD004L21E, VFD007L21D, VFD007L21E

Wire Gauge: 22-24AWG, Torque: 4Kgf-cm



## Bağlantı Notları: KURULUM YAPMADAN ÖNCE LÜTFEN OKUYUNUZ.

➤ U/T1, V/T2, W/T3 terminalerine AC power girişi kesinlikle bağlamayınız. Bu durum AC sürücüye zarar verebilir.

➤ Tüm vidasın iyice sıkıldığından emin olun.

1. Kurulum sırasında, cihazın kurulacağı ülkenin tüm ulusal ve yerel elektrik ve güvenlik kurallarına uyulmalıdır.

2. Güç kaynağı ve AC sürücü arasında gereklili koruyucu cihazların (devre kesici veya sigorta) bağlı olduğuna emin olun. (Topraklama direnci 0.1Ω ~ 'aşınmalıdır')

3. Tüm bağlantı uçlarının doğru olduğuna ve AC sürücünün doğru toplaklandığına emin olun. (Topraklama direnci 0.1Ω ~ 'aşınmalıdır')

4. Toprak bağlantılarını mümkün olduğunda kısa tutun ve bağlantı yaparken AWG/MCM standartlarına uyunuz.

5. Birçok VFD-L ünitesi aynı yerde kurulabilir. Bütün cihazlar ortak ground terminaline bağlanarak toplaklanmalıdır. VFD-L ground terminaleri aşağıda görüntüldüğü gibi paralel de bağlanabilir. Toprak bağlantısı yapıldıktan sonra döngü oluşturulmamalıdır.



6. U/T1, V/T2, ve W/T3 AC sürücü çıkış terminalerini U, V, ve W, motor çıkış terminalerine sırasıyla bağlandıktan zaman ve ileri komut verildiğinde, motor saat yönü tersine döner (Motor mil ucundan baktırma). Motorun yönünü değiştirmek için motorun herhangi iki bağlantı ucunun yerini değiştirilir.

7. Besleme kaynağının AC sürücünün ihtiyaç duyduğu giriş voltagını ve giriş akımını sağladığından emin olun.

8. AC sürücü enerjili iken kablo bağlantısı yapılmamalı veya kablo sökülmemelidir.

9. AC sürücü çalıştırırken ana devreye müdahale etmem ve sinyal görüntülemeyin.

10. Güç ve kontrol kablolarnı birbirinden ayıran veya dikey olarak bağlayın.

11. Eğer EMI'yi (Electro-Magnetic Interference) düşürmek için filtre kullanmak gerekiyorsa, filter AC sürücüye mümkün olduğunda yakın olmalıdır. EMI, Taşıyıcı (Carrier) frekans değerlerine dayanıklı olmalıdır.

12. Eğer AC sürücünün yük reaktörü gereken bir ortama kurulması gerekiyorsa, filter AC sürücünün U/T1, V/T2, W/T3 bağlantı yakın bağlanmalıdır. Kapasitor, L-C Filtre (Inductance-Capacitance) veya R-C Filtre (Resistance-Capacitance) kullanılmamalıdır.

13. GFCI (Ground Fault Circuit Interrupt) kullanılırken, hatalardan kaçınmak için akım sensörü minimum akımda 200mA seçilmeli, minimum algılama zamanına (0.1-saniye) sahip olmalıdır.

## 4 Parametre Özeti

Pr.	Fonksiyonlar	Ayarlar	Fabrika Değeri
1-18	Yavaşlama S-eğrisi Ayarı	0 ~ 7	0

## Grup 2: Çalışma Parametreleri

Pr.	Fonksiyonlar	Ayarlar	Fabrika Değeri
2-00	Frekans komutu (ayarlama) seçimi	0: Digital keypad 1: AVI'dan 0 ~ 10V 2: AVI'dan 4 ~ 20mA 3: Sürücü üzerindeki potansiyometre(V.R) 4: RS-485 haberleşme arabirimini	0
2-01	Çalışma komutu (RUN/STOP) seçimi	0: Digital keypad 1: Harici terminalerden, keypad STOP aktif 2: Harici terminalerden, keypad STOP pasif 3: RS-485 haberleşme arabirimini, keypad STOP aktif 4: RS-485 haberleşme arabirimini, keypad STOP pasif	0
2-02	Duruma metodu	0: Rampali durma 1: Serbest durma	0
2-03	Taşıyıcı frekans	3 ~ 10K Hz	10
2-04	Ters (geri) çalışma engeli	0: Ters çalışma aktif (enable) 1: Ters çalışma pasif (disable) 2: İleri çalışma pasif (disable)	0
2-05	ACI (4 ~ 20mA) giriş kesildiğinde çalışma seçimi	0: OH'ze yavaşlar 1: Aniden durur ve displayde EF görür. 2: Son algılanan frekans ile çalışır.	0
2-06	Enerji gelince çalışma engeli	0: Aktif (Enable) 1: Pasif (Disable)	0

## Grup 3: Çıkış Fonksiyon Parametreleri

Pr.	Fonksiyonlar	Ayarlar	Fabrika Degeri
3-00	Istenilen frekansa ulaşıldı	1.0 ~ 400 Hz	1.0
3-01	Terminal sayacı değeri	0 ~ 999	0
3-02	Ön sayacı değeri	0 ~ 999	0
3-03	Cök-fonksiyonlu çıkış (róle çıkış)	0: Kullanılmaz 1: AC sürücü çalışıyor 2: Maksimum çıkış frekansına ulaşıldı 3: Sıfır hızı 4: Aşırı tork 5: Base-Block (B.B.) 6: Düşük voltaj algılama 7: AC Sürücü çalışma modu 8: Hata göstergesi 9: İstenilen frekansa ulaşıldı (3-00) 10: PLC program çalışıyor 11: PLC program adımı tamamlandı 12: PLC program tamamlandı 13: PLC program çalışması durdur 14: Terminal sayıcı değerine ulaşıldı (3-01) 15: Ön sayıcı değerine ulaşıldı (3-02) 16: Hazır durum göstergesi	8

## Grup 4: Giriş Fonksiyon Parametreleri

Pr.	Fonksiyonlar	Ayarlar	Fabrika Değeri
✓4-00	Potansiyometre minimum nokta frekansı (eğim)	0.0~350Hz	0.0
✓4-01	Potansiyometre eğim (çalışma yönü) seçimi	0: positif eğim 1: negatif eğim	0
✓4-02	Potansiyometre frekans kazancı	1~200%	100
4-03	Potansiyometre geri (ters) hareket izni	0: kullanılmaz 1: ters (geri) hareket izni 2: sadece ileri yönde hareket	0
4-04	Cök-fonksiyonlu giriş terminal1 (M1) (d 0~d 20)	0: M0: FWD/STOP, M1: REV/STOP 2: M0: RUN/STOP, M1: FWD/REV 3: M0, M1, M2: 3-kablolu çalışma kontrol modu 4: Harici hata, normalde açık (N.A.) 5: Harici hata, normalde kapalı (N.K.) 6: RESET 7: Çoklu-adım hız komutu 1 8: Çoklu-adım hız komutu 2 9: jog çalışma 10: Hızlanma/Yavaşlama hız engeli 11: Birinci veya ikinci hız/yavaş. zamanı seçimi 12: Base-block (B.B.), normalde açık (N.A.) 13: Base-block (B.B.), normalde kapalı (N.K.) 14: Display frekansı artırma 15: Display frekansı azaltma 16: PLC program çalıştırma 17: PLC durdurma 18: Sayıcı tetikleme sinyali 19: Sayıcı reset 20: ACI sec/AVI birak	1
4-05	Cök-fonksiyonlu giriş terminal2 (M2)		6
4-06	Cök-fonksiyonlu giriş terminal3 (M3) (d 0, d 4~d 20)		7

## Grup 5: Çoklu-adım Hız ve PLC Parametreleri

Pr.	Fonksiyonlar	Ayarlar	Fabrika Ayarı
5-00	1 <sup>nci</sup> adım hız frekansı	0.0 ~ 400Hz	0.0
5-01	2 <sup>nci</sup> adım hız frekansı	0.0 ~ 400Hz	0.0
5-02	3 <sup>rd</sup> adım hız frekansı	0.0 ~ 400Hz	0.0

5-03	PLC çalışma modu	0: PLC çalışma pasif (disable) 1: Bir program çevrimi çalıştır 2: Program çevrimlerini sürekli çalıştır 3: Bir program çevrimini adım adım çalıştır. (STOP'dan ayrı olarak) 4: Program çevrimlerini sürekli adım adım çalıştır. (STOP'dan ayrı olarak)	0
5-04	PLC ileri/geri hareket seçimi	0 ~ 15 (0: İleri, 1: Geri)	0
5-05	Step 0 zaman ayarı	0 ~ 65500 Saniye	0
5-06	Step 1 zaman ayarı	0 ~ 65500 Saniye	0
5-07	Step 2 zaman ayarı	0 ~ 65500 Saniye	0
5-08	Step 3 zaman ayarı	0 ~ 65500 Saniye	0

## Grup 6: Koruma Parametreleri

Pr.	Fonksiyonlar	Ayarlar	Fabrika Değeri
6-00	Aşırı-voltaj önleme seviyesi	0:pasif (disable) 350~410V	390
6-01	Aşırı-akım önleme seviyesi	0: pasif (disable) 20~200%	170
6-02	Aşırı-tork algılama çalışması	0:pasif (disable) 1:sabit hızla çalışmada aktif ve limite ulaşana kadar çalışmaya devam eder. 2:sabit hızla çalışmada aktif, aşırı-tork algılanınca durur.	0
6-02	Aşırı-tork algılama çalışması	3:hızlanmadan aktif ve limite ulaşana kadar çalışmaya devam eder. 4:hızlanmadan aktif, aşırı-tork algılanınca durur.	
6-03	Aşırı-tork algılama seviyesi	30 ~ 200%	150
6-04	Aşırı-tork algılama zamanı	0.1 ~ 10.0 Saniye	0.1
6-05	Elektronik termik aşırıyük rolesi	0: Yok 1: standart motor 2: özel motor	0
6-06	Elektronik termik karakteristiği	30~600 Saniye	60
6-07	Mevcut hata kaydı	0: Hata yok 1: oc (aşırı akım) 2: ov (aşırı voltaj)	0
6-08	İkinci hata kaydı	3: oh (aşırı ısı) 4: ol (aşırı yük)	
6-09	Üçüncü hata kaydı	5: ol1 (elektronik termik)	
6-10	Dördüncü hata kaydı	6: EF (harici hata) 7: Kullanılmıyor 8: Kullanılmıyor 9: oCa (hızlanmadan aşırı akım) 10: ocd (yavaşlamadan aşırı akım) 11: ocn (sabit çalışmada aşırı akım)	
6-11	Beşinci hata kaydı		
6-12	Altıncı hata kaydı		

## Grup 7: Motor Parametreleri

Pr.	Fonksiyonlar	Ayarlar	Fabrika Değeri
✓7-00	Motor akım oranı	30~120 %	85
✓7-01	Motor yüksüz akımı	0 ~ 90 %	50
✓7-02	Tork karşılama ayarı	0 ~ 10	1
✓7-03	Kayma karşılama ayarı	0.0 ~ 10.0	0.0

## Grup 8: Özel Parametreler

Pr.	Fonksiyonlar	Ayarlar	Fabrika Değeri
8-00	DC frenleme voltaj seviyesi	0 ~ 30%	0
8-01	Başlangıçta DC frenleme zamanı	0.0 ~ 60.0 Saniye	0.0
8-02	Durmadı DC frenleme zamanı	0.0 ~ 60.0 Saniye	0.0
8-03	DC frenleme başlangıç noktası	0.0 ~ 400.0 Hz	0.0
8-04	Anı elektrik kesintisi durumunda çalışma seçimi	0: Anı elektrik kesintisi sonrası çalışma durur. 1: Anı elektrik kesintisinden sonra çalışmaya devam eder. Hiz araması ana frekans ile başlar.	0
8-05	Maksimum izin verilen enerji kesintisi zamanı	0.3 ~ 5.0 Saniye	2.0
8-06	Hiz araması için B.B. zamanı	0.3~5.0 Saniye	0.5
8-07	Maksimum hız araması akım seviyesi	30~200%	150
8-08	Atlama frekansı 1 üst sınır	0.0~400 Hz	0.0
8-09	Atlama frekansı 1 alt sınır	0.0~400 Hz	0.0
8-10	Atlama frekansı 2 üst sınır	0.0~400 Hz	0.0
8-11	Atlama frekansı 2 alt sınır	0.0~400 Hz	0.0
8-12	Atlama frekansı 3 üst sınır	0.0~400 Hz	0.0
8-13	Atlama frekansı 3 alt sınır	0.0~400 Hz	0.0
8-14	Hata sonrası otomatik yeniden başlama sayısı	0~10	0
8-15	AVR fonksiyonu	0: AVR fonksiyonu aktif (enable) 1: AVR fonksiyonu pasif (disable) 2: Yavaşlamada AVR fonksiyonu pasif (disable)	2
8-16	Dinamik fren voltajı	350 ~ 450V	380
8-17	DC fren alt sınırı	0.0 ~ 400 Hz	0.0

## Grup 9: Haberleşme Parametreleri

Pr.	Fonksiyonlar	Ayarlar	Fabrika Değeri
✓9-00	Haberleşme adresi	1 ~ 247	1
✓9-01	İletişim hızı	0: Baud rate 4800 bps 1: Baud rate 9600 bps 2: Baud rate 19200 bps	1
✓9-02	Haberleşme koptuğunda çalışma seçimi	0: Uyarı ve çalışmaya devam eder 1: Uyarı ve rampalı durur 2: Uyarı ve serbest durur 3: Uyarmadan çalışmaya devam eder	0
✓9-03	Modbus haberleşme watchdog timer	0: Pasif (Disable) 1~20: 1 ~ 20 Saniye	0
✓9-04	Haberleşme protokolü	<b>ASCII mod</b> 0: 7,N,2 1: 7,E,1 <b>RTU mod</b> 2: 7,O,1 3: 8,N,2 4: 8,E,1 5: 8,O,1	0