

A21系列面板式力矩驱动器
A21 Series Torque Controller
使用说明书
Operation Instruction



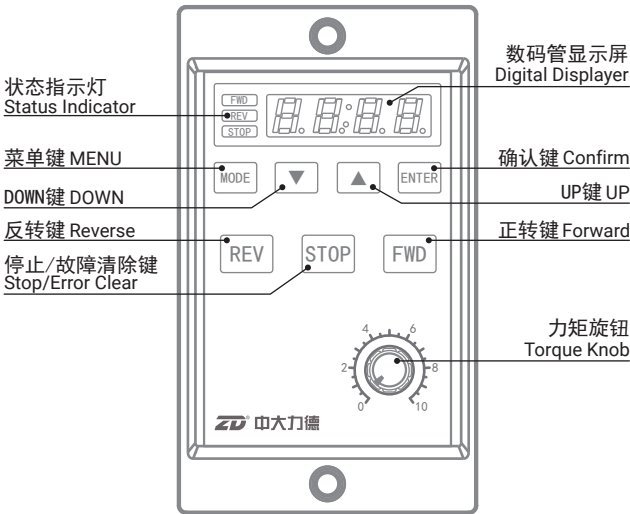
致用户 To Users:
感谢您购买并使用本产品，为保证安全及正确操作，在使用前请务必仔细阅读此说明书。
Thanks to purchase and use the product, in order to ensure safe and correct operation, please read this instruction before usage.

1 功能及特点 Features

- 采用MCU数字控制技术，功能丰富，性能优异；
Multi-function and high performance of MCU digital control technology;
- 采用数显菜单式选项，修改设定方便快捷；
Easy setting with digital display of menu;
- 可实现缓慢加大力矩、缓慢减小力矩；
Slow torque increasing and decreasing is capable;
- 可面板操作、外接开关控制；
External keyboards and switch are available;
- 面板旋钮自动匹配最大力矩，力矩控制方便、安全；
Easy and safe toque controlling and function of adjusting motor torque deviation;
- 自动识别输入电源频率；
Automatically recognize input power frequency;
- 附电机散热风扇电源接口，方便接线。
Attached power connector for fan, easy connection.

2 面板介绍 Panel Introduction

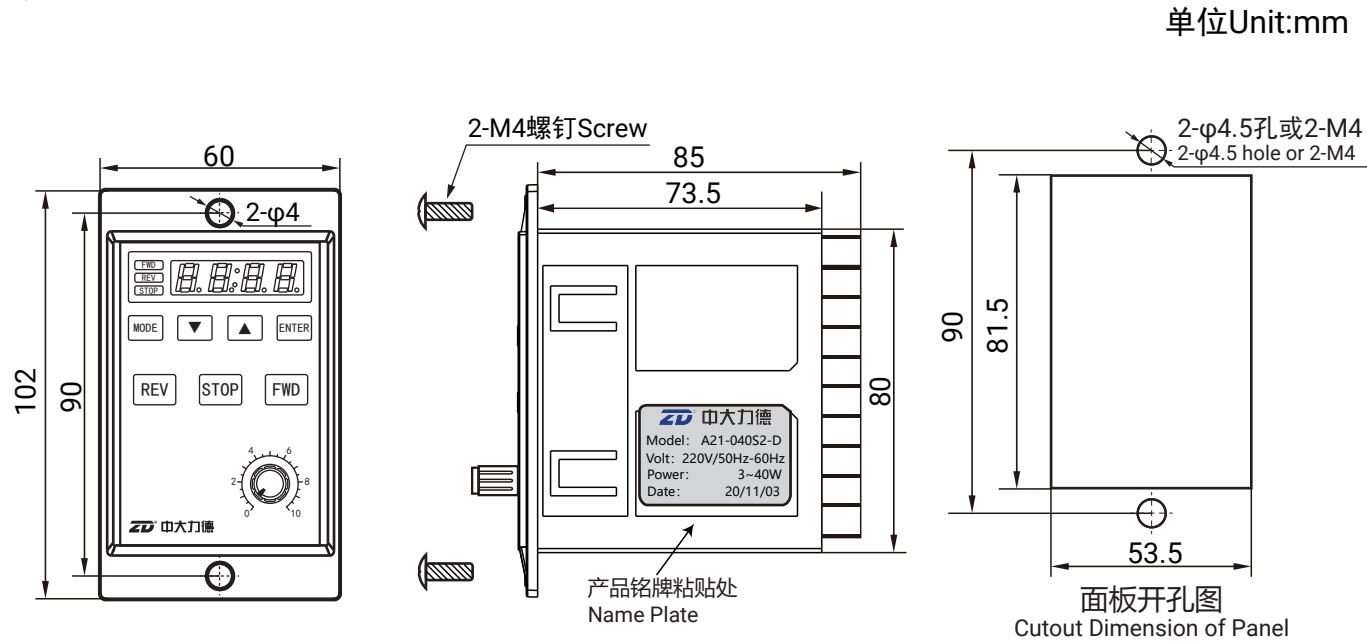
名称 Name	功能 Function
指示灯 Indicator Light	用于显示运行状态 For showing running status
数码管 Digital Tube	四位数码管用于显示参数值与设定值 4-digital tube is used to show parameter value and set value
MODE 键 MODE	进入或退出菜单模式 Enter into or exist from MENU
ENTER 键 ENTER	用于显示和确认设定值 Show and confirm set value
▼/▲ 键 ▼/▲ 键	按键控制时调节参数；菜单模式下调节设定值 Adjust parameter when it is under the condition of button controlling; adjust set value under the mode of MENU
FWD/REV 键 FWD/REV	面板控制时控制正/反转；菜单模式下修改数位 Forward or reverse when it is in the panel control mode, while change the digital when it is in the MENU mode
STOP 键 STOP	停止运转；故障复位 Stop the running; error reset
旋钮 Knob	旋钮控制时调节参数 Change the specifications when it is in the knob control mode



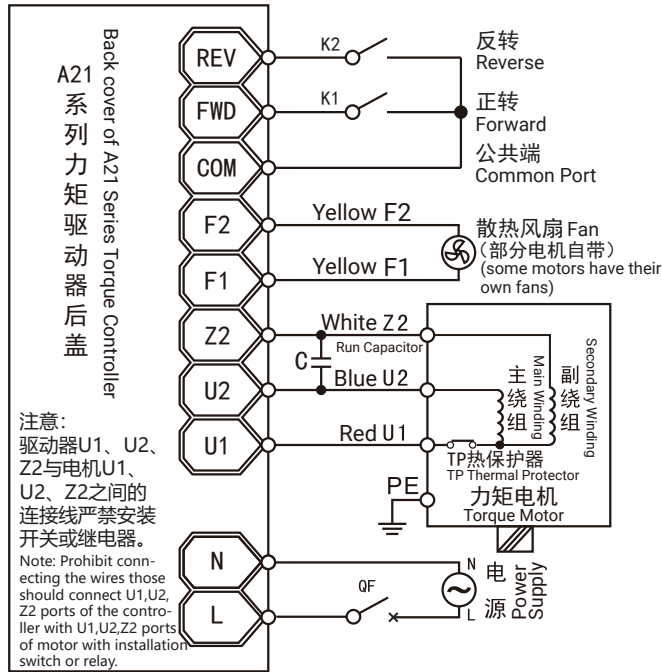
3 型号/性能参数表 Model Number/Function Specifications Table

型号 Model Number	ZDRV.A21-040S2-D				
型号定义 How to Read	产品类型: ZDRV Model Type: ZDRV	系列: A21 Series:A21	适用电机功率: 3~40(W) Applicable Motor Power:3~40(W)	电源: S1单相 110V±10%; S2单相 220V±10% Power Supply:S1 Single Phase 110V±10% S2 Single Phase 220V±10%	功能: D 带数显 Function: D with digital display
使用电机类型 Applicable Motor Type	力矩电机 Torque Motor				
适用电机功率 Applicable Motor Power	3W	6W	10W	20W	40W
安装方式 Installation Method	面板式 Panel Type				
运动控制功能 Motion Control Function	面板或外接开关运转控制、调整力矩、缓慢加大力矩、缓慢减小力矩 Controlled by panel or external switch including motion control, adjust torque, slowly increase or decrease torque.				
力矩调整方式 Torque Adjust Method	面板▲、▼按键；面板旋钮 Press ▲,▼ button on panel; Knob on panel				
力矩调整范围 Torque Adjustment Range	0~100%				
运行电容 Run Capacitor	外置（外置于力矩电机包装内，需用户自行连接） External Type (Externally installed on the torque motor, users need to connect it)				
输入电源 Input Power	单相 220V±10%；50Hz-60Hz Single Phase 220V±10%;50Hz-60Hz				
使用环境 Usage Environment	环境温度: -20℃~+40℃（无冻结）；环境湿度: 85%以下（无结露）；海拔 1000M 以下 Environment Temperature: -20℃~+40℃(No freezing); Environment Humidity: Less than85%(No condensation); Altitude lower than 1000m				

4 外形及安装 Outline & Installation



5 驱动器接线图 How to Connect the Driver



● 旋转方向控制 Rotation Direction Control

1、面板按键控制：菜单设置运转控制模式F-01改为“1”，操作面板按键；

1. Panel Control: change the MENU Control Mode F-01 into “1”, controlled by panel buttons;

2、外接开关控制：菜单设置运转控制模式F-01改为“2”或“3”，外接K1、K2开关。

2. External Switch Control: change the MENU Control Mode F-01 into “2” or “3”, controlled by external switches K1,K2;

● 运行电容C规格表 Run Capacitor C Specifications Table:

电源电压 Voltage of Power Supply	220V		110V	
	50Hz	60Hz	50Hz	60Hz
电机功率 Motor Power				
3W	1.5μF/450V	1.2μF/450V	7μF/250V	6μF/250V
6W	2μF/450V	1.5μF/450V	8μF/250V	7μF/250V
10W	2.5μF/450V	2μF/450V	10μF/250V	8μF/250V
20W	3.5μF/450V	3μF/450V	15μF/250V	12μF/250V
40W	6μF/450V	6μF/450V	30μF/250V	30μF/250V

注：表格来自中大力矩电机宣传页，运行电容按电机型号配，放置于力矩电机包装内。
Note:The Torque motor specifications have been referred and the run capacitor should be matched with relevant motors, it will be packed in with the torque motor.

电源电压 Power Supply	电机功率 Motor Power	QF电流规格 QF Current Specifications
220V	3-40W	1A
110V	3-40W	2A

● 电源 Power Supply

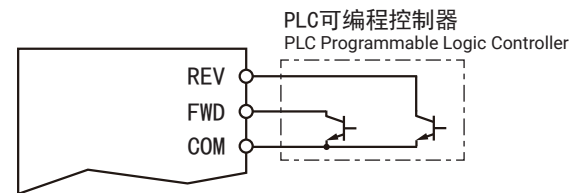
电源电压必须与驱动器电源电压规格一致。
The voltage of the power supply should be the same with driver.

QF为断路器，发生短路时保护驱动器和力矩电机。
QF is a circuit breaker, it can protect the driver and the torque motor in case of short-circuited.

○力矩电机内装自动复位型热保护器(TP)，当电机运转过热，热保护器切断电机电源，电机停止运转；当电机温度下降后，热保护器自动复位供电，电机重新运转。故在进行检查操作时，请务必事先切断电源，防止发生事故。
The automatic reset type thermal protector has been built in the torque motor, when the motor is over heated, the thermal protector will run and cut off the power supply of the motor, and then the motor will be stopped; when the temperature drops into that of safe running, the thermal protector will run and automatically supply the power again and the motor will re-run. To prevent any accidents, please cut-off the power before check the motor.



○自动复位型热保护器，动作温度：120°C±5°C，复位温度：120°C±5°C。
Automatic reset type thermal protector, operation temperature:120°C±5°C, reset temperature: 120°C±5°C.



● FWD、REV采用PLC可编程控制器控制

FWD/REV is controlled by PLC

PLC输出方式：NPN或漏型晶体管输出；

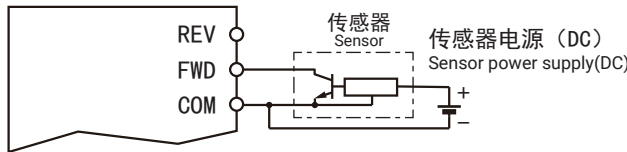
PLC Output Method: NPN or drain transistor output;

菜单设置：运转控制模式F-01改为“2”或“3”

外接开关控制。

Menu Setting: Change the Operation Control Mode F-01 into “2”or “3”

Controlled by external switch.



● FWD、REV采用传感器控制（光电开关等）

FWD/REV is controlled by sensor(Photoelectric switch etc.)

开关输出方式：三线式NPN晶体管输出；

Switch Output Method: 3-wire type NPN transistor output;

菜单设置：运转控制模式F-01改为“2”或“3”

外接开关控制。

Menu Setting: Change the Operation Control Mode F-01 into “2”or “3”

Controlled by external switch.

6 驱动器菜单 Controller Menu

● 功能码列表（R/W：可读/写；R0：只读）：

Function Codes Table (R/W: Readable/Writable; R0: Read Only)

功能码 Function Code	名称 Name	参数详细说明 Detailed Parameter Description	设定范围 Setting Range	缺省值 Default Value	更改 Change
F-01	运转控制模式 Run Control Mode	1: 操作面板控制 1: By Operation Panel 2: 外接开关控制，面板 STOP 键无效 2: By External Switch, STOP Button on Panel is invalid 3: 外接开关控制，面板 STOP 键有效 3: By External Switch, STOP Button on Panel is valid	1~3	1	R/W
F-02	旋转方式 Rotation Mode	1: 允许正反转 1: Allow to Forward and Reverse 2: 允许正转，禁止反转 2: Allow to Forward, disallow to Reverse 3: 允许反转，禁止正转 3: Allow to Reverse, disallow to Forward	1~3	1	R/W
F-03	旋转方向 Rotation Direction	1: 不取反 1: No Converse 2: 取反 2: Converse	1~2	1	R/W
F-04	力矩调整方式 Torque Control Method	1: 面板 UP/DOWN 按键 1: UP/DOWN Button on Panel 2: 面板旋钮 2: Panel knob	1~2	1	R/W
F-05	最大力矩 Max. Torque	50%~100% 限制最大力矩，防止力矩过大，损坏产品或设备 50%~100% Limit the Max. Torque to protect the damage of product or device	50~100	80	R/W
F-06	正转启动加速时间 Start-up Acceleration Time for Forward Rotation	0.1~10.0 秒 正转启动时力矩增大至最大值时间 0.1~10.0 s The time for increasing to Max.Torque when it starts forwarding	0.1~10.0	1.0	R/W
F-07	正转停止减速时间 Stop Deceleration Time for Forward Rotation	0.1~10.0 秒 正转停止时力矩减小至 0 时间 0.1~10.0 s The time for decreasing to 0Nm when it stop forwarding.	0.1~10.0	1.0	R/W
F-08	反转启动加速时间 Start-up Acceleration Time for Reverse Rotation	0.1~10.0 秒 反转启动时力矩增大至最大值时间 0.1~10.0 s The time for increasing to Max.Torque when it starts reversing	0.1~10.0	1.0	R/W
F-09	反转停止减速时间 Stop Deceleration Time for Reverse Rotation	0.1~10.0 秒 反转停止时力矩减小至 0 时间 0.1~10.0 s The time for decreasing to 0Nm when it stops reversing	0.1~10.0	1.0	R/W
F-10	电源频率设定 Power Supply Frequency Setting	1: 驱动器自动检测 1: Driver Self-detection 2: 电源频率 50Hz 2: Supply Power Frequency 50Hz 3: 电源频率 60Hz 3: Supply Power Frequency 60Hz	1~3	1	R/W

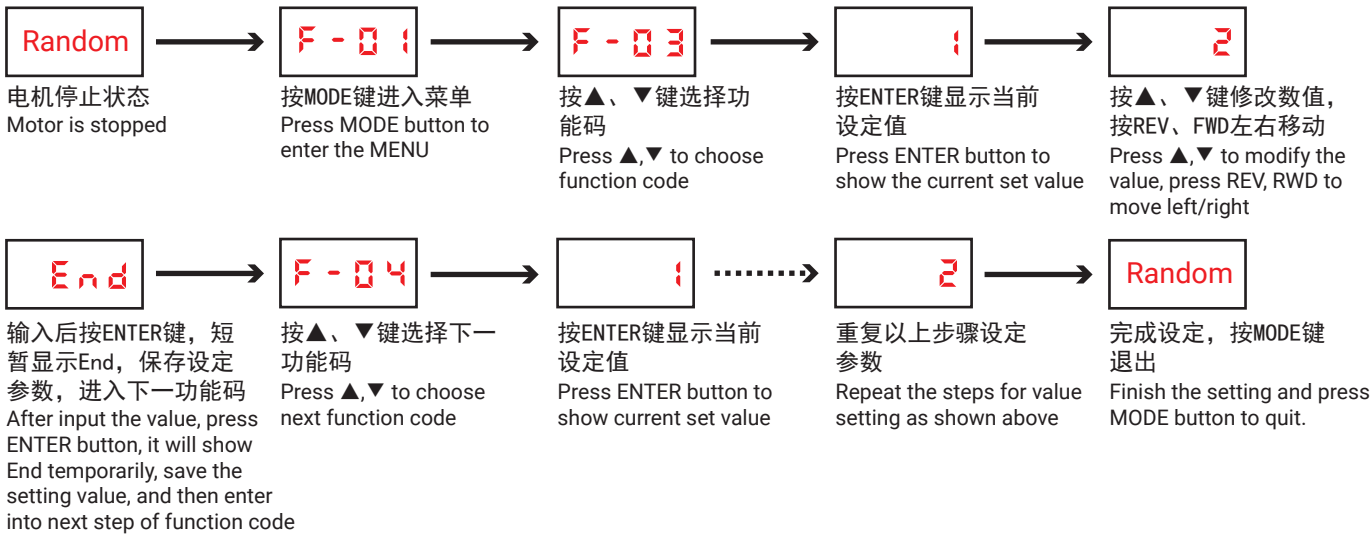
F-11	恢复出厂设置 Reset	1: 不恢复 1: Do not Recover 2: 恢复 2: Recover	1~2	1	R/W
F-12	当前适配电源频率 Current Adaptive Power Frequency	50: 适配 50Hz 交流电源 50: Adapt to 50Hz AC Power Supply 60: 适配 60Hz 交流电源 60: Adapt to 60Hz AC Power Supply	50,60	**	RO
F-13	程序版本 Program Version			*.**	RO

故障维护和状态显示:
Trouble-shooting & Status:

	名称 Name	原因 Cause	处理方法 How to Solve
故障码 Error Code	E.EEP	参数存储故障 Data Saving Error	重新上电解除警报 Re-power to clear the alarm
提示码 Prompt Code	S.run	电机当前处于运行状态, 禁止修改功能码 Motor is running, any modification is prohibited.	按STOP键停机后修改 Press STOP button and then modify
	S.not.	该按键当前处于无效状态 Function of the button is currently invalid.	修改F-01、F-02或F-04功能码 Modify F-01\F-02 or F-04 function code
	S.Err	驱动器当前处于故障状态 Driver is currently having an error.	清除故障后重试 Clear the error and re-start
	S.loc	按键当前处于上锁状态 The button is locked.	同时按下 DOWN 和 ENTER 键解锁 Press both DOWN and ENTER buttons at same time

7 菜单修改 Menu Modification

- 为保证安全, 请在电机停止的状态下进行修改, 运行状态下不可修改。
For safety, please stop the motor and then modify. Modification is not allowed when the motor is running.



注: 在驱动器处于运行或者停机界面时, 同时按下MODE和ENTER两个按键, 按键将处于上锁状态, 按键不再具有控制电机或者进入菜单等功能; 同时按下DOWN和ENTER两个按键, 可以解除按键上锁状态, 恢复按键功能。
Note: When the driver is running or stopping, press MODE and ENTER buttons at the same time, the buttons will be locked and won't have the functions to control the motor or enter the MENU etc.; and then press MODE and ENTER buttons at the same time, it will release the lock.

8 使用须知 User Instruction

- 使用前请先检查包装是否完好, 铭牌和购买的型号是否一致, 配件是否完整。
配件: 使用说明书(本书)——1本; M4*10螺钉——2个。
Check if the package is ok, nameplate is consistent with purchased model, and if you received all the accessories.
Accessories: 1 Operation instruction; 2 bolts (M4*10).
- 安装、连接、检查等作业须由专业技术人员进行。
Installation, connection and inspection should be done by professional engineers.
- 请按照本说明书或后盖标识正确接线, 否则可能会造成故障及危险。
Correctly wiring according to this operation instruction or label at the back cover to avoid error or danger.
- 请勿在通电状态下拆卸设备或更改接线, 否则可能会造成触电。
Do not disassemble the device or change the wiring when power is on, it may cause electric shock.
- 第一次使用时, 请进行空转试运行, 确认功能是否正常, 并调整需要使用的参数。
Before first-time usage, do run without load first to check if everything is working normally and adjust the using specification.
- 请勿在爆炸性环境、易燃性气体环境、腐蚀性环境以及容易沾上水的场所或可燃物周围使用。
Do not use in explosive environments, flammable gas, corrosive environments and anywhere easy to get wet or around combustibles.
- 避免连续振动、过度冲击, 否则可能对设备造成损伤。
Avoid continuous vibration or over-impact.
- 需要接地的设备, 请务必将接地端子接地。
Do earthing.
- 电机在正常运转状态下, 有时电机外壳表面的温度可能会超过70℃。因此在可能触及电机的使用环境下请用户自行加贴右图所示的(小心高温)警告标志!
Under normal operation of the motor, sometimes the surface temperature of the motor case will exceed 70℃, therefore, please paste a warning notice (refer to the drawing below) in case people may touch the motor!

