

(Technical Data) EA Series Economy–Type Speed Controller

A21 Series Torque Control Type
User Manual

Dear User:

Thank you for purchasing and using this product. To ensure safety and correct operation, please read this manual carefully before use.

1 Functions and Features

- Uses MCU digital control technology and offers rich functions and excellent performance;
- Equipped with a digital display menu for quick and convenient parameter adjustment;
- Capable of gradually increasing and decreasing torque;
- Supports panel operation and external switch control;
- The panel knob automatically matches the maximum torque, ensuring convenient and safe torque control;
- Automatically detects the input power frequency;
- Equipped with a motor cooling fan power interface for easy wiring.

2 Precautions for Use

- Before use, please check whether the packaging is intact, whether the nameplate matches the purchased model, and whether all accessories are included.
Accessories: M4*10 screws — 2 pcs.
- Installation, wiring, inspection, and related tasks must be performed by qualified technical personnel.
- Please follow this manual or the wiring label on the rear cover for correct wiring; otherwise, malfunction or danger may occur.
- Do not disassemble the device or alter wiring while the power is on, as this may result in electric shock.
- For first-time use, please perform a no-load test run to confirm that functions operate normally, and adjust the required parameters.
- Do not use the device in explosive atmospheres, flammable gas environments, corrosive environments, areas exposed to water, or near combustible materials.
- Avoid continuous vibration or excessive impact, as this may damage the device.
- For devices that require grounding, ensure that the grounding terminal is properly connected.
- During normal operation, the motor housing temperature may sometimes exceed 70°C. Therefore, in environments where the motor may be touched, please attach a “Caution: High Temperature” warning label as shown in the illustration on the right.



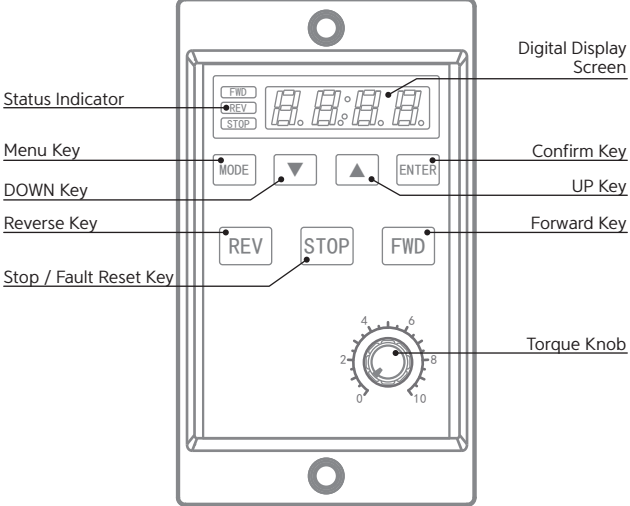
3 Model / Performance Parameter Table

Model	EA-A21S2-40				
Model Definition	Product Type: EA	Series: A21	Power Supply: S1 Single-phase 110V ±10%; S2 Single-phase 220V ±10%	Applicable Motor Power: 3-40 (W)	
Applicable Motor Type	Torque Motor				
Applicable Motor Power	3W	6W	10W	20W	40W
Installation Method	Panel-mounted				
Motion Control Functions	Panel or external switch operation control; torque adjustment; gradual torque increase; gradual torque decrease				
Torque Adjustment Methods	Panel ▲/▼ keys; panel rotary knob				
Torque Adjustment Range	0~100%				
Run Capacitor	External (provided inside the torque motor package; user must connect manually)				
Input Power Supply	Single-phase 220V ±10%; 50Hz-60Hz				
Operating Environment	Ambient Temperature: -20°C ~ +40°C (no freezing); Ambient Humidity: Below 85% (no condensation); Altitude below 1000 m				

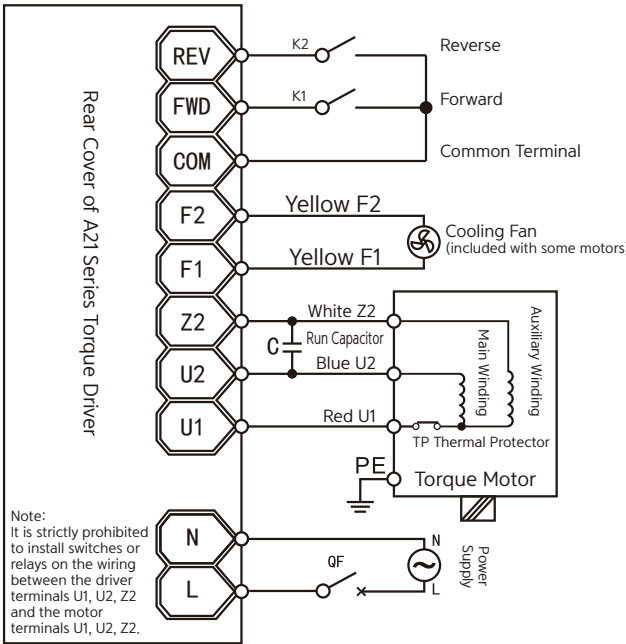
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4 Panel Description

Name	Function
Indicator	Indicates operating status
Digital Display	Four-digit display for parameter and setting values
MODE Key	Enter or exit menu mode
ENTER Key	Display and confirm setting values
▼/▲ Keys	Adjust parameters during key control; adjust settings in menu mode
FWD/REV Key	Controls forward/reverse rotation; changes digits in menu mode
STOP Key	Stop operation; fault reset
Rotary Knob	Adjust parameters in knob control mode



5 Driver Wiring Diagram



- Rotation Direction Control
1. Panel Key Control: Set Operating Control Mode F-01 to “1” in the menu to control using the panel keys;
2. External Switch Control: Set Operating Control Mode F-01 to “2” or “3” in the menu to use external switches K1 and K2.

● Run Capacitor C Specification Table:

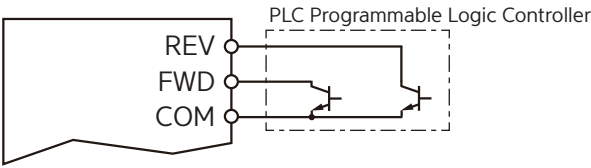
Power Supply Voltage	220V		110V	
	50Hz	60Hz	50Hz	60Hz
3W	1.5μF/450V	1.2μF/450V	7μF/250V	6μF/250V
6W	2μF/450V	1.5μF/450V	8μF/250V	7μF/250V
10W	2.5μF/450V	2μF/450V	10μF/250V	8μF/250V
20W	3.5μF/450V	3μF/450V	15μF/250V	12μF/250V
40W	6μF/450V	6μF/450V	30μF/250V	30μF/250V

Note: The table is taken from the torque motor catalog. The run capacitor is matched according to the motor model and included in the torque motor package.

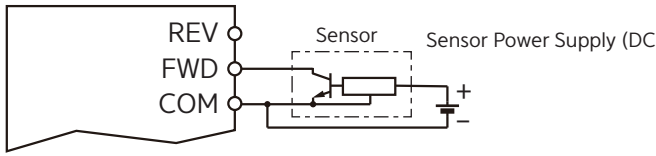
- Power Supply
The power supply voltage must match the driver’s rated input voltage. QF is a circuit breaker that protects the driver and torque motor in case of a short circuit.

Power Supply Voltage	Motor Power	QF Current Rating
220V	3~40W	1A
110V	3~40W	2A

- The torque motor is equipped with an automatic–reset thermal protector (TP). When the motor overheats, the protector disconnects the motor power supply, causing the motor to stop. When the motor cools down, the protector automatically resets and restores power, allowing the motor to run again. Therefore, always disconnect the power supply before performing inspection or maintenance to prevent accidents.
- Automatic–reset thermal protector: trip temperature 120°C ±5°C, reset temperature 120°C ±5°C.



- FWD and REV Controlled by PLC
PLC Output Type: NPN or open–collector transistor output;
Menu Setting: Set Operating Control Mode F-01 to “2” or “3” for external switch control.



- FWD and REV Controlled by Sensors (photoelectric switch, etc.)
Switch Output Type: Three–wire NPN transistor output;
Menu Setting: Set Operating Control Mode F-01 to “2” or “3” for external switch control.

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6 Driver Menu

● Function Code List (R/W: Read/Write; RO: Read-Only):

Function Code	Name	Parameter Description	Setting Range	Default Value	Modification Allowed
F-01	Operation Control Mode	1: Panel Operation Control 2: External Switch Control; panel STOP key disabled 3: External Switch Control; panel STOP key enabled	1~3	1	R/W
F-02	Rotation Mode	1: Forward and reverse rotation allowed 2: Forward rotation allowed, reverse rotation prohibited 3: Reverse rotation allowed, forward rotation prohibited	1~3	1	R/W
F-03	Rotation Direction	1: Normal direction 2: Reverse direction	1~2	1	R/W
F-04	Torque Adjustment Methods	1: Panel UP/DOWN Keys 2: Panel Rotary Knob	1~2	1	R/W
F-05	Maximum Torque	50%~100% Limits the maximum torque to prevent excessive torque from damaging the product or connected equipment	50~100	80	R/W
F-06	Forward Start Acceleration Time	0.1~10.0 seconds Time for torque to increase to maximum during forward	0.1~10.0	1.0	R/W
F-07	Forward stop deceleration time	0.1~10.0 seconds Time for torque to decrease to zero during forward stop	0.1~10.0	1.0	R/W
F-08	Reverse start acceleration time	0.1~10.0 seconds Time for torque to increase to maximum during reverse	0.1~10.0	1.0	R/W
F-09	Reverse stop deceleration time	0.1~10.0 seconds Time for torque to decrease to zero during reverse stop	0.1~10.0	1.0	R/W
F-10	Power Frequency Setting	1: Auto-detection by driver 2: Power frequency 50 Hz 3: Power frequency 60 Hz	1~3	1	R/W
F-11	Restore Factory Settings	1: Do not restore 2: Restore	1~2	1	R/W
F-12	Current Adapted Power Frequency	50: Compatible with 50 Hz AC power supply 60: Compatible with 60 Hz AC power supply	50,60	**	RO
F-13	Software Version			***	RO
F-14	Terminal Control Operating Mode	1: FWD: Forward rotation; REV: Reverse rotation 2: FWD: Direction; REV: Enable	1~2	1	R/W
F-15	Power-off State Memory for Key Operation	1: Not stored 2: Stored (saves current controller operating state)	1~2	1	R/W
F-16	Digital Input Filter Time	0~1000 ms	0~1000	50	R/W

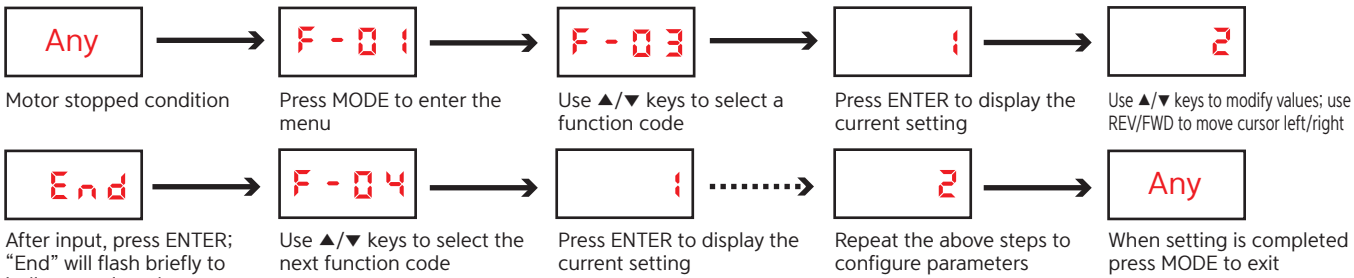
● Fault Maintenance and Status Indication:

	Name	Cause	Solution
Fault Code	E.EEP	Parameter storage fault	Power cycle to clear the alarm
Warning Code	S.run	The motor is currently running; function codes cannot be modified	Stop the motor with the STOP key before making changes
	S.not.	This key is currently disabled	Modify function code F-01, F-02, or F-04
	S.Err	The driver is currently in a fault state	Clear the fault and try again
	S.loc	The keys are currently locked	Press DOWN and ENTER simultaneously to unlock

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7 Menu Editing

● For safety reasons, parameter editing is only allowed when the motor is stopped; editing is disabled during operation.



Note: When the driver is in operation or stop display mode, pressing MODE and ENTER simultaneously will lock the keys. All key functions (motor control and menu entry) are disabled. Press DOWN and ENTER simultaneously to unlock and restore key functions.

8 Appearance and Installation

