



Low Cost, Small Package, AC Power Input 3 Phase Microstepping Drive

三相细分驱动器

Cyclone's EM-AC3 is a low-cost, high performance, high-reliability 3 phase microstepping drive in a small package. The design of the EM-AC3 provides up to 5.2 Amps of current to the motor and accepts 95-132VAC power only. All step motors are subject to mid-range instability or oscillations. The EM-AC3 incorporates an anti-resonance circuitry that aggressively and effectively suppresses these oscillations, thus taking advantage of the full capabilities of the step motor.

Features

Performance

Designed for use with motor inductance of 0.8 mH - 80mH, Selectable resolution up to 60,000 steps/rev

Auto standby reduces motor current (and heating) at rest

Provides 0.5 Amps to 5.2 Amps (peak)

95-132VAC power supply input

Physical

Simplified, 2-screw mounting

Overall dimensions: 68x146x178mm

Certified as UL-recognized component

Approvals: CE (LVD), and CE (EMC)

EM-AC3 is a constant angle and constant torque stepper motor drive. The driven voltage range from AC95V to 132V. It can match 3-phase hybrid stepper motors whose rated current is under 5.2A and shaft diameter range from 86mm to 110mm. Owe to bipolar constant chopping circuit, it can make motors low noise and operated smoothly when low speed; the torque is much greater than 2-phase and 5-phase stepper motor when high speed. It is widely used in small-sized numerical control device such as medical machine, robot, instrumentation, curving machine, laser labeling machine, inner laser curving machine.

Feature

- High performance, low price
- 16 channels constant angle and constant torque, the highest subdivision is 60000s/r
- Highest response frequency: 200Kpps
- The motor phase current is reduced to approximately 50% of the set current value 100ms after receiving the last pulse edge
- Bipolar constant current chopping circuit
- Opto-isolated input/output
- Driven current is adjustable in 16 channels from 0.3A/phase to 5.2A/phase
- Single power supply, voltage arrange from AC95V to 132V
- Phase remembering function (The driver remembers motor's phase when there's no input pulse is received for 5s and it recovers the motor's phase when the power on or signal MF is ineffective)

Input signal oscillogram

Current setting

1. STOP/Im is the rotary switch that can set output current of holding motor status as 20%-80% of normal output current (increase in CW, decrease in CCW).
2. RUN/Im is the rotary switch for adjustment of the motor current.

| | | | | | | | | | | | | | | | | |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| R-1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| Im(A) | 0.3 | 0.7 | 1.0 | 1.3 | 1.7 | 2.0 | 2.3 | 2.6 | 3.0 | 3.3 | 3.6 | 4.0 | 4.3 | 4.6 | 4.9 | 5.2 |

Subdivision setting

EM-AC3 drive has two groups of subdivision, each group has 16 channels set by switch SK1/SK2.

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| SK1 | F | E | D | C | B | A | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| s/r | 400 | 500 | 600 | 800 | 1000 | 1200 | 2000 | 3000 | 4000 | 5000 | 6000 | 10000 | 12000 | 20000 | 30000 | 60000 |

SK2 is the second group. The subdivision setting of SK2 is the same as SK1.

Choose SK1 group when subdivision choosing signal SM is low voltage and SK2 at high voltage.

Parameter switch function

| | |
|-----|--|
| DP3 | OFF, single pulse: PU is pulse signal, DR is direction signal |
| | ON, double pulse: PU is positive pulse signal, DR is negative pulse signal |
| DP4 | Self detect switch (OFF: accept pulse input, ON: send out 7.5KHz pulse) |

Wiring example

Caution

1. Please don't reverse the power supply, supply voltage shouldn't exceed AC132V.
2. Input control signal is 5V, current-limiting resistance should be connected when over 5V.
3. Alarm indicator lights and the drive shuts off if the drive temperature is over 70°C. It doesn't work until the temperature falls to 50°C. The heat sink is needed when overheat occurs.
4. Alarm indicator lights when overcurrent (short of load) occurs. Please check motor's connection and other shorts and turn the power supply on after removing the trouble.
5. Alarm indicator lights when undervoltage (the voltage is less than AC40V) occurs.

Terminal function

| Mark | Function | Specification |
|------|--|---|
| MF+ | Positive of opto-isolated | Connected to +5V power supply. Driven voltage range from +5V to +24V. Current-limiting resistance is needed when over 5V. |
| MF- | Motor free signal | The motor current will be cut off and the drive stops working when it effects. |
| SM+ | Positive of opto-isolated | Connected to +5V power supply. Driven voltage range from +5V to +24V. Current-limiting resistance is needed when over 5V. |
| SM- | Subdivision choosing signal | Choose subdivision by SK1 when low voltage and SK2 when high voltage. Input resistance is 220Ω. |
| DR+ | Positive of opto-isolated | Connected to +5V power supply. Driven voltage range from +5V to +24V. Current-limiting resistance is needed when over 5V. |
| DR- | DP3=ON, DR is direction signal | Change the motor's direction of rotation. Input resistance is 220Ω. Low voltage 0-0.5V, high voltage 4-5V, pulse width>2.5μS |
| | DP3=OFF, DR is negative pulse signal | |
| PU+ | Positive of opto-isolated | Connected to +5V power supply. Driven voltage range from +5V to +24V. Current-limiting resistance is needed when over 5V. |
| PU- | DP3=ON, PU is pulse signal | With the falling edge of the signal PU, the motor executes an angular step. The input resistance is 220Ω. Low voltage 0-0.5V, high voltage 4-5V, pulse width>2.5μS. |
| | DP3=OFF, PU is positive pulse signal | |
| TM+ | Positive of opto-isolated origin output signal | When the motor current is on, the motor is at the origin position. Opto-isolated output (high voltage). Connect TM+ to current-limiting resistance, TM- to ground. The maximum driven current is 50mA, the highest driven voltage is 50V. |
| TM- | Negative of opto-isolated origin output signal | |
| RDY+ | Positive of opto-isolated ready signal | It is active (low voltage) when the drive is ready for receiving controller's signal. |
| RDY- | Negative of opto-isolated ready signal | |
| ~AC | Power supply | AC95V-132V |
| U | Connection | |
| V | | |
| W | | |

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