

## User Manual

# T6 Series AC Servo Driver



# T6 AC Servo Driver

T6 Series AC servo products are a cost-effective AC digital servo drive which is designed mainly for position high accurate control, power range up to 1kw, which can provide intelligent performance with efficient configuration methods.

Combined with abundant features such as MFC, vibration suppression, Multi-mode filter function etc., it provides machines a Compact size, low tuning works, high resolution encoder up to 23 bits ,which can be used for high accuracy applications

## Features:

- ◆ Space Vector Modulation (SVM) Technology
- ◆ Efficient configuration methods: 2 parameters related, robust Control
- ◆ Automatic identification for motor type with 17bit/23bit encoder
- ◆ Variety of external command signal: Pulse&Direction
- ◆ Build-in motion engine, internal motion controller used
- ◆ P-N Junction: Exchange power of entire servo drives
- ◆ Encoder output function

## Technical Specification

| Model                        | T6-400RS   |              | T6-750RS  | T6-1000RS |
|------------------------------|--|--------------|---|-----------|
| Rated Power (W)              | 400  |              | 750   | 1000      |
| Cont current(Arms)           | 3  |              | 5.2   | 7         |
| Peak Current(A)              | 13   |              | 18.4  | 26.5      |
| Dimension(mm)                | 175*168*40   |              | 175*168*50  |           |
| Power Supply                 | Single phase or three phase 220V -15%~+10% 50/60HZ   |              |   |           |
| Control Method               | IGBT SVPWM sinusoidal wave drive   |              |   |           |
| Encoder Feedback             | <ul style="list-style-type: none"> <li>• 17bit incremental encoder/absolute encoder</li> <li>• 23bit multi-turn absolute encoder</li> </ul>  |              |   |           |
| IO                           | Digital IO   | Inputs       | <ul style="list-style-type: none"> <li>• 4 programmable digital inputs</li> <li>• allows sink input/source input</li> <li>• within the range from 12 VDC to 24 VDC, 30mA</li> </ul> |           |
|                              |  | Outputs      | <ul style="list-style-type: none"> <li>• 3 programmable digital outputs (2 single-ended, 1 differential)</li> <li>• within the range from 12 VDC to 24 VDC, 30mA</li> </ul>         |           |
|                              | Pulse  | Pulse Input  | <ul style="list-style-type: none"> <li>• Max. input frequency:</li> <li>• 500 kHz (differential input);</li> <li>• 200kHz (open collector input)</li> </ul>                         |           |
|                              | Encoder Output   | Pulse Output | Encoder ABZ output (A/B/Z single-ended, Z differential)   |           |
| Communication Port           | RS232  |              | For configuration connection  |           |
|                              | RS-485   |              | Modbus/RTU, 1:N communication up to 31axes to a host  |           |
| Control Mode                 | <ul style="list-style-type: none"> <li>• Profile Modes/Position/Build-in Position/Build-in Velocity/Jog</li> </ul>   |              |   |           |
| Operation Interface          | Five LED tubes and five keys   |              |   |           |
| Electronic gear ratio        | 1~8388608  |              |   |           |
| Input Function Configuration | Servo-ON. Alarm clear. Positive/Negative Limit. Control mode switching. Gain switching. Deviation counter clear. Command pulse inhibition. Electronic gear switching. Torque limit switching. Speed zero clamp. Speed command sign input. Torque command sign input. E-STOP. Inertia ratio switching. Internal speed selection |              |   |           |

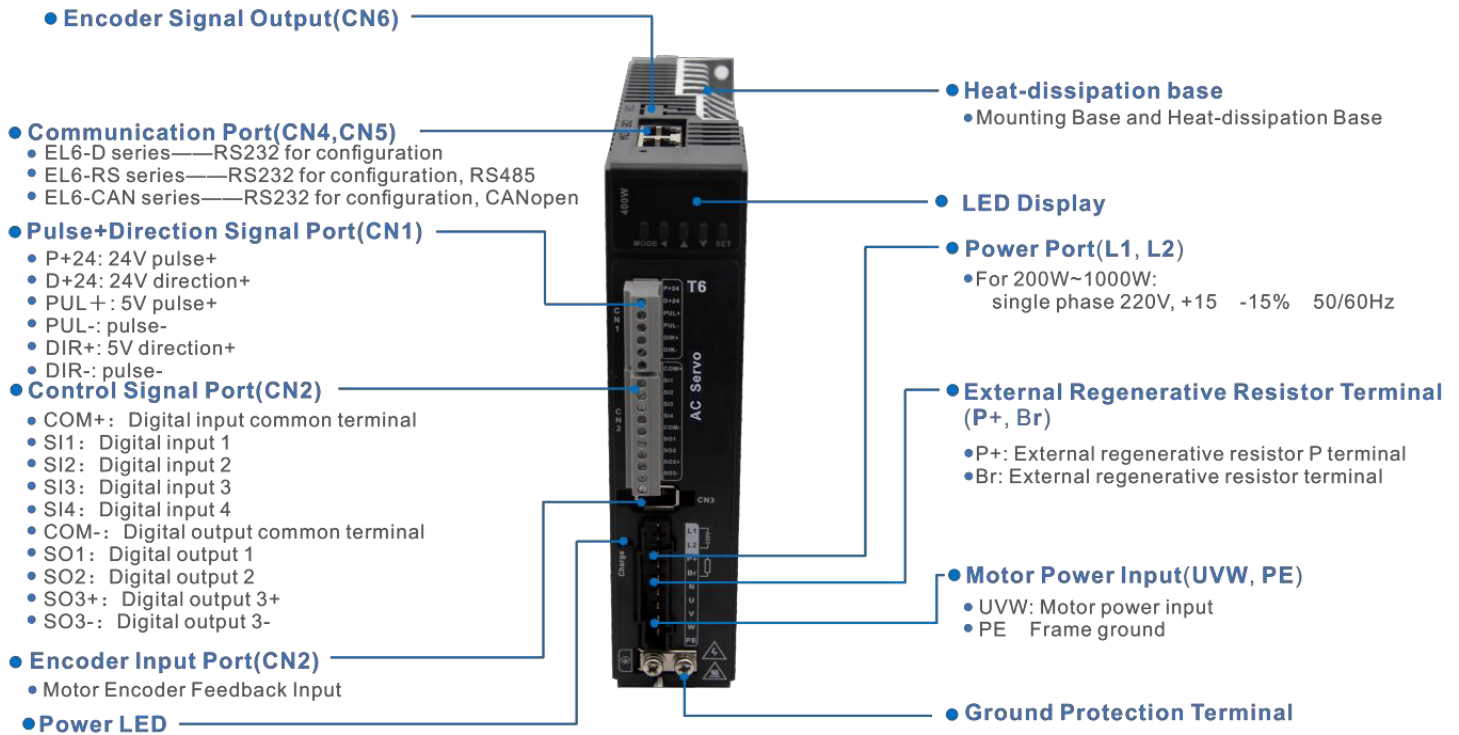
|                                      |             |   |
|--------------------------------------|-------------|---|
| <b>Output Function Configuration</b> |             | Alarm output. Servo-Ready. Positioning complete. At-speed. Zero-speed. Velocity coincidence. Positional command ON/OFF. Servo-ON. Home-OK   |
| <b>Safety Protection</b>             |             | Over-Current. Over-Voltage. Under-Voltage. Over-Heat. Over-Load. Encoder error. Over-Speed. Running-away. Positive/Negative Limit. Communication error. Position deviation error. Power-line out of |
| <b>Environment</b>                   | Temperature | Storage: -20-80°C; Installation: 0-55°C   |
|                                      | Humidity    | Under 90%RH (free from condensation)  |
|                                      | Altitude    | Lower than 1000m  |
|                                      | Vibration   | Less than 0.5G (4.9m/s <sup>2</sup> ) 10-60Hz (non-continuous working)  |

## Talent Functions

|  |  |
|--|--|
| <b>Inertia ratio identification</b>  |  |
| Off-line inertia ratio identification, better performance, easy tuning   |  |
| <b>Position mode/Velocity mode</b>   |  |
| Supported Position mode/Velocity mode/Torque mode  |  |
| <ul style="list-style-type: none"> <li>Position mode: Profile position/Pulse &amp; direction/Built-in position/RS232/RS485</li> <li>Velocity mode: Profile velocity/Built-in velocity/RS232/RS485</li> </ul>                                     |  |
| <b>Control mode switching</b>  |  |
| IO signal for mode switching, select Position mode/Velocity mode   |  |
| <b>Gain switching</b>  |  |
| Automatically switch gain under special conditions/ IO signal for gain switching   |  |
| <b>16 path build-in position mode/velocity</b>   |  |
| No analog control required. Execute by digital IO signal or RS485  |  |
| <b>Command pulse inhibition</b>  |  |
| Invalid the pulse input, stop with deceleration  |  |
| <b>Limit switch</b>  |  |
| Protective equipment operation   |  |
| <b>Programmable Inputs and Outputs</b>   |  |
| <ul style="list-style-type: none"> <li>4 programmable digital inputs</li> <li>3 programmable digital outputs (2 single-ended, 1 differential)</li> </ul>   |  |
| <b>Encoder signal output</b>   |  |
| Output encoder signal: Single-ended /Differential  |  |
| <b>Speed zero clamp</b>  |  |
| If the actual analog input is less than the setting value, the motor will stop rotating in servo-on condition  |  |
| <b>Vibration Suppression</b>   |  |
| Specific resonance frequency can be obtained from PC upper computer software according to waveform monitoring, and filter frequency can be set to effectively suppress the oscillation ripple of a certain frequency in the current instruction. |  |
| <b>Command filter</b>  |  |
| To make the positional command divided or multiplied by the electronic gear smooth, set the command filter   |  |
| <b>Friction torque compensation</b>  |  |
| Apply feed forward torque superposition directly to torque command   |  |

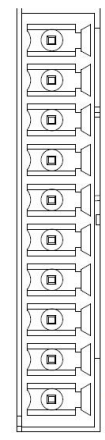
## Connectors and Pin Assignment

| Port | Function                          |
|------|-----------------------------------|
| CN1  | Pulse + Direction Signal Port     |
| CN2  | Digital input/output Port         |
| CN3  | Encoder Input Port                |
| CN4  | RS232( only for tuning )<br>RS485 |
| CN5  | RS485                             |
| CN6  | Encoder output Port               |
| X1   | Power Port                        |

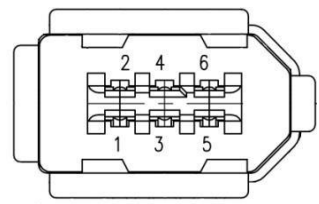


### Signal Explanation of Control Signal Port-CN1 and CN2

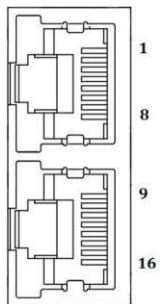
| Port |  | Pin | Signal   | Name          | Explanation   |
|------|--|-----|----------|---------------|---|
| CN1  |  | 1   | PUL +_24 | 24V pulse+    | Max. input frequency:<br>● 500 kHz (differential input);<br>● 200kHz (open collector input) |
|      |  | 2   | DIR +_24 | 24V           |   |
|      |  | 3   | PUL +    | 5V pulse+     |   |
|      |  | 4   | PUL -    | Pulse-        |   |
|      |  | 5   | DIR +    | 5V direction+ |   |
|      |  | 6   | DIR -    | Direction-    |   |

| Port |   | Pin | Signal | Name                            | Explanation   |
|------|---|-----|--------|---------------------------------|---|
| CN2  |  | 1   | COM+   | Digital input common terminal   | 4 programmable digital inputs<br>• allows sink input/source input<br>• within the range from 12 VDC to 24 VDC, 30mA |
|      |   | 2   | SI1    | Digital input 1                 |   |
|      |   | 3   | SI2    | Digital input 2                 |   |
|      |   | 4   | SI3    | Digital input 3                 |   |
|      |   | 5   | SI4    | Digital input 4                 | • 2 programmable digital single-ended outputs<br>• within the range from 12 VDC to 24 VDC, 30mA                     |
|      |   | 6   | COM -  | Digital output common- terminal |   |
|      |   | 7   | SO1    | Digital output 1                |   |
|      |   | 8   | SO2    | Digital output 2                | • 1 programmable digital differential output<br>• within the range from 12 VDC to 24 VDC, 30mA                      |
|      |   | 9   | SO3 +  | Differential Digital output 3   |   |
|      |   | 10  | SO3 -  |                                 |   |

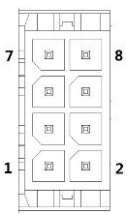
**Encoder Input Port-CN3**

| Port |  | Pin | Signal |
|------|--|-----|--------|
| CN3  |  | 1   | VCC5V  |
|      |  | 2   | GND    |
|      |  | 3   | BAT+   |
|      |  | 4   | BAT-   |
|      |  | 5   | SD+    |
|      |  | 6   | SD-    |
|      |  |     | PE     |

**Bus connector- CN4 and CN5**

| Port    |   | Pin   | Signal      |
|---------|---|-------|-------------|
| CN4 CN5 |  | 1, 9  | RDO+(RS485  |
|         |   | 2, 10 | RDO-(RS485- |
|         |   | 3, 11 | /           |
|         |   | 4, 12 | /           |
|         |   | 5, 13 | /           |
|         |   | 6, 14 | TXD(RS232)  |
|         |   | 7, 15 | RXD(RS232)  |
|         |   | 8, 16 | GND(RS232   |
|         |   |       | PE          |

**Encoder output Port-CN6**

| Port |   | Pin | Signal | Name  | Explanation   |
|------|---|-----|--------|---|---|
| CN6  |  | 1   | OCZ    | OC output terminal of motor encoder Z phase           | Differential output, High >= 2.5vdc, low <= 0.5vdc, maximum current ±20mA |
|      |   | 2   | GND    | OC output GND terminal of motor encoder               |   |
|      |   | 3   | Z +    | Differential output terminal of motor encoder Z phase |   |
|      |   | 4   | Z -    |   |   |
|      |   | 5   | B +    | Differential output terminal of motor encoder B phase |   |
|      |   | 6   | B -    |   |   |
|      |   | 7   | A +    | Differential output terminal of motor encoder A phase |   |
|      |   | 8   | A -    |   |   |

# Wiring

## Position Control Mode

