



T7 Series AC Servo

User Manual



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T7 Series AC Servo Drives - 220V

T7 Series AC servo products 220V are high performance AC digital servo which is designed for position/velocity/torque high accurate control with power rating ranging up to 1kW which provides a perfect solution for different applications with easy tuning process.

T7 series AC servo drives are using the latest Digital Signal Processing (DSP) chip and Intelligent Power Module (IPM) with compact components integration and great reliability. Using the best PID calculation for Pulse Width Modulation (PWM) control, our T7 series products are the one to beat in this product category.

Highlights:

- ① Easy tuning
- ② ETG COE + EtherCAT DSP402 communication protocol
- ③ Internal regenerative resistor
- ④ Equipped with notch filter, damping filter
- ⑤ Motors automatically identified
- ⑥ Motors with holding brake



Technical Specification

T7 series		T7-400EC	T7-750EC	T7-1000EC
Rated power (W)		400	750	1000
Rated Current (A)		3.5	5.5	7
Peak Current (A)		9.2	16.6	18.7
Size (mm)		40*175*156	50*175*156	
Main Power Supply		Single phase AC 220V, -15%~+10%, 50/60Hz		
Control Circuit Power Supply				
Drive mode		IGBT PWM sinusoidal wave drive		
Control mode		Position	Profile Position Mode (PP)	
			Cyclic Synchronous Position Mode (CSP)	
			Homing Mode (HM)	
		Velocity	Profile Velocity Mode (PV)	
			Cyclic Synchronous Velocity Mode (CSV)	
			Torque	Profile Torque Mode (PT)
Cyclic Synchronous Torque Mode (CST)				
Encoder Feedback		RS485 protocol: 23-bit magnetic encoder		
I/O	Digital Input	4 Digital Inputs (Supports NPN and PNP)		
		Configurable input signals under EtherCAT mode:	1. Clear Alarm (A-CLR) 2. Positive limit switch (POT) 3. Negative limit switch (NOT) 4. Homing switch (HOME-SWITCH) 5. Emergency stop (E-Stop)	
	Digital Output	3 Digital Outputs (2 single-ended, 1 differential)		
		Configurable output signals under EtherCAT mode:	1. Alarm (ALM) 2. Servo ready (SRDY) 3. External brake off (BRK-OFF) 4. Positioning completed (INP)	

			<ul style="list-style-type: none"> 5. Velocity at arrival (AT-SPEED) 6. Torque limiting command (TLC) 7. Zero speed position (ZSP) 8. Velocity coincidence (V-COIN) 9. Position command (P-CMD) 10. Velocity limit (V-LIMIT) 11. Velocity command (V-CMD) 12. Servo enabled (SRV-ST) 13. Homing done (HOME-OK)
	Encoder Output	Encoder ABZ differential pulse output	
	Probe Input	2 high speed probe inputs: EXT1+/EXT1-, EXT2+/EXT2-	
Communication Port	USB mini	Modbus USB2.0 (No need to connect driver to power supply)	
	EtherCAT	EtherCAT, Communication up to 128 axes to a host	
Software		Driver tuning through Motion Studio Ver. 1.4.x. Parameters tuning in current loop, position loop, velocity loop; Modify I/O signal and motor parameters; Variables(velocity, position deviation, etc.) monitoring using step diagrams	
Driver Front Panel		5 push buttons and 8-segments display	
Holding brake		Built-in (Supports external brake)	
Safety Protection		Overcurrent. Overvoltage. Undervoltage. Overheat. Overload. Overtravel. Single-Phasing. Regenerative resistor error. Position deviation error. Encoder feedback error. Excessive braking rate. EEPROM error	
Environment	Temperature	Storage: -20-80°C (Condensation free); Installation: 0-55°C (Not frozen)	
	Humidity	Under 90%RH (Condensation free)	
	Altitude	Up to 1000m above sea level	
	Vibration	Less than 0.5G (4.9m/s ²) 10-60Hz (non-continuous working)	
	IP ratings	IP20	

Servo Drive Features

Inertia ratio determination
Simple online and offline inertia ratio determination to simplify servo drive tuning.
Control mode switching
Position/Velocity/Torque mode can be switched easily by delivering an I/O signal.
Auto gain adjustment
Measure real time mechanical stiffness and set gain values automatically.
Gain switching
Automatically switch gain to suppress vibration, shorten positioning time and improve following behavior.
Feedforward gain
Reduce position deviation and increase system responsiveness. Including velocity and torque feedforward.
Vibration Suppression
Suppress mechanical resonance and mechanical end vibration by applying filters.
Model following control
Reference model to improve responsiveness to command and closed loop control to increase responsiveness towards interference.
Friction compensation
Compensate for changes in load to reduce the effect of friction on motion.

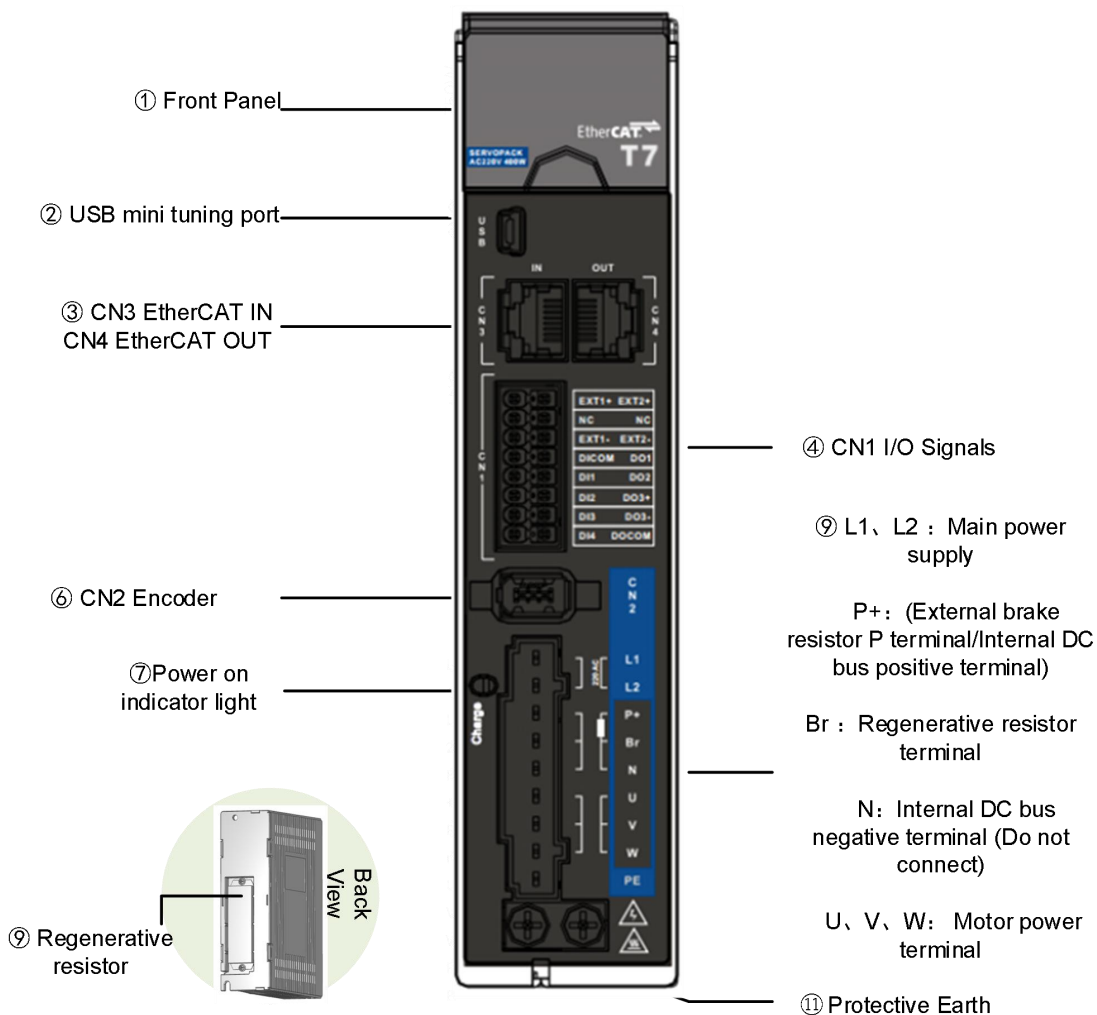
T7 series AC Servo Drive Model Structure

T7-750 EC

① ② ③

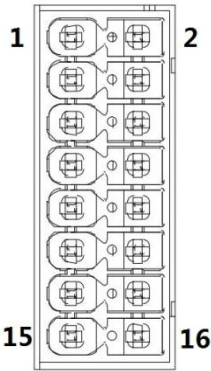
No.	Description
①	Series No. T7: Servo drive series
②	Power rating 400: 400W 750: 750W 1000:1000W
③	Command source EC: EtherCAT

Ports and connectors

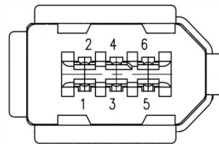


CN1 I/O Signal Port

CN1 connector is a 16-pin spring loaded connector.

Port	Pin	Signal	Description	Remarks
	1	EXT1+	Probe 1 positive terminal	2 high speed probe inputs function
	2	EXT2+	Probe 2 positive terminal	
	3	NC	Reserved	
	4	NC	Reserved	
	5	EXT1 -	Probe 1 negative terminal	
	6	EXT2 -	Probe 2 negative terminal	
	7	DICOM	Common DI	Double-ended common DI Configurable Recommended voltage: 12VDC - 24VDC
	9	DI1	Reserved	
	11	DI2	POT: Positive limit switch	
	13	DI3	NOT: Negative limit switch	
	15	DI4	HOME: Homing done	D01,D02: Single-ended D03: Double-ended Configurable Recommended voltage: 12Vdc – 24Vdc, max 30V Recommended current: 10mA, max 50mA
	8	DO1	ALM: Alarm	
	10	DO2	BRK-OFF: Holding brake activated	
	12	DO3+	INP: Positioning completed	
	14	DO3-		
	16	DOCOM	Common DO	

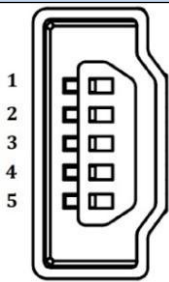
CN2 Encoder



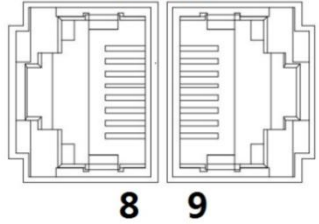
Connector	Pin	Signal	Description
CN2	1	VCC5V	Power supply 5V
	2	GND	Power supply ground
	3	BAT+	Battery positive terminal
	4	BAT-	Battery negative terminal
	5	SD+	SSI Data+
	6	SD-	SSI Data-
	Frame	PE	Shield grounding

SB mini Communication Port

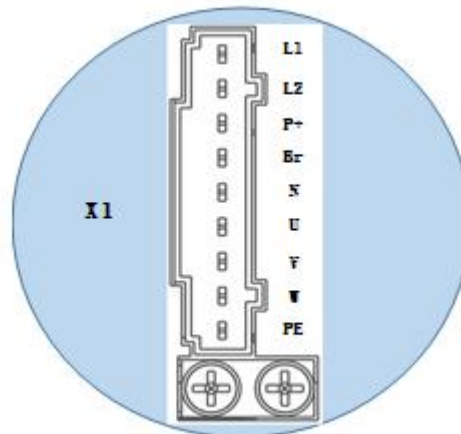
Parameters tuning on Motion Studio can be done without connecting main power supply to driver.

Connector	Port	Pin	Signal	Description
USB mini		1	VCC5V	Power supply 5V
		2	D+	USB data positive terminal
		3	D-	USB data negative terminal
		4	--	--
		5	GND	Power supply ground
		Frame	USB_GN D	Ground through capacitor

CN3/CN4 EtherCAT Communication Port

Port	Pin	Signal	Description
	1, 9	E_TX+	EtherCAT Data sending positive terminal
	2, 10	E_TX-	EtherCAT Data sending negative terminal
	3, 11	E_RX+	EtherCAT Data receiving positive terminal
	4, 12	--	--
	5, 13	--	--
	6, 14	E_RX-	EtherCAT Data receiving negative terminal
	7, 15	--	--
	8, 16	--	--
	Frame	PE	Shielded ground

X1 Main Power Supply Port



Port	Pin	Functions	Remarks
X1	L1	Single phase 220VAC , +10 ~ -15% , 50/60Hz	(1) Optional isolation transformer (2) Do not connect to 380VAC directly to prevent damage to driver. (3) In case of serious interference, it is recommended to connect a line filter to main power supply; It is recommended to install a fuseless circuit breaker to cut off power supply in time when the driver fails.
	L2		
	P +	(1) Internal DC bus positive terminal (2) External regenerative resistor P terminal	Please refer to user manual for details on regenerative resistors connections
	Br	External regenerative resistor terminal	
	N		Please do not connect
	U	Motor U terminal	Please ensure proper wire connection on motor.
	V	Motor V terminal	
	W	Motor W terminal	
PE	Motor Protective Earth	Please ground PE of driver and motor together	

T7-EC Series 400W/750W/1000W – 220V Models

