

# EL7 Series AC Servo Drive

EL7 Series AC servo products are high performance AC digital servo which is designed for position/velocity/torque high accurate control , power range up to 2kw ,which can provide intelligent performance with easy tuning process .

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

## Feature:

- ◆ Easy tuning, flexible to control
- ◆ Automatic identification for motor type
- ◆ RS485/Modbus/EtherCAT
- ◆ Notch filter, Damping filter
- ◆ Dynamic brake
- ◆ 17bit /23bit absolute encoder
- ◆ Internal resistor



## Technical Specification

Type	EL7-*400Z	EL7-*750Z	EL7-*1000Z	EL7-*1500Z	EL7-*2000Z
Cont current	3.5	5.5	7	10	12
Peak Current	10.5	16.5	21	30	36
Power Supply	100W~2KW	Main Power	Single phase or three phase 220V -15%~+10% 50/60HZ		
		Control Power	Single 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	Input	9 inputs (Support common+ and common- two wiring modes) , functions can be configured, 12~24Vdc,30mA		
		Output	6 outputs (4 single-ended, 2 differential) , functions can be configured, 12~24Vdc,30mA		
	Analog	Input	2 analog input( <i>optional</i> ), -10~+10Vdc, input resistance 20KΩ, no isolation		
	Pulse	Input Pulse	0-500kHz, 5V differential input/24V Single-ended		
Output Pulse		Encoder ABZ output (3 single-ended, 3 differential)			
Communication Port	USB		PC debug		
	RS-485		Modbus/RTU( <i>optional</i> ), 1:N communication up to 31axes to a host		
	EtherCAT		EtherCAT ( <i>optional</i> ), 1:N communication up to 128 axes to a host		
Control Mode	<ul style="list-style-type: none"> <li>◆ Position mode: pulse+direction, internal register position setup, RS232/485</li> <li>◆ Velocity mode: analog, internal register velocity setup. RS232/485</li> <li>◆ Torque mode: analog</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 phase etc.	
<b>Dynamic braking</b>	Built-in	
<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)

## Features

<b>Inertia ratio identification</b>
Off-line inertia ratio identification, better performance, easy tuning
<b>Position mode/Velocity mode/Torque mode</b>
Supported Position mode/Velocity mode/Torque mode <ul style="list-style-type: none"> <li>● Position mode: pulse+direction. internal register position setup. RS232/485</li> <li>● Velocity mode: analog. internal register velocity setup. RS232/485</li> <li>● Torque mode: analog</li> </ul>
<b>Control mode switching</b>
IO signal for mode switching, select Position mode/Velocity mode/Torque mode
<b>Gain switching</b>
Automatically switch gain under special conditions/ IO signal for gain switching
<b>Internal 16 path velocity mode</b>
No analog control required. 16 path speed and IO trigger
<b>Command pulse inhibition</b>
Invalid the pulse input, stop with deceleration
<b>Position limit</b>
Protective equipment operation
<b>Input and output signal allocation function</b>
<ul style="list-style-type: none"> <li>● Set SI input function allocation</li> <li>● Set SO output function allocation</li> </ul>
<b>Encoder signal output</b>
Output encoder signal: Single-ended /Differential
<b>Analog Input</b>
2 analog input for velocity / torque mode control
<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

**EL7 series servo driver**

**EL7-D 2000 Z**

① ② ③ ④

NO	Details				
①	Series Num	EL7: New series servo driver			
②	Command source	D: Stand version (Pulse+direction) RS: RS485 (Pulse+direction/Analog Input/Modbus) EC: EtherCAT			
③	Power	0100:100W	0200: 200W	0400: 400W	0750: 750W 0850 : 850W 1000: 1000W 1300:1300W 1500: 1500W 2000: 2000W
④	Encoder	Z: Serial encoder			

**ELM series servo motor**

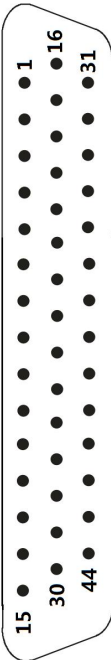
**ELM 0400 F L 80 H-SS**

① ② ③ ④ ⑤ ⑥ ⑦

NO	Details						
①	Series Num	ELM: ELM series motor					
②	Power	0100:100W	0200: 200W	0400: 400W	0600:600w	0750: 750W 0850 : 850W 1000: 1000W 1300:1300W 1500: 1500W 2000: 2000W	
③	Encoder Type	D:17bit single-turn		E: 17bit multi-turn			
		F:17bit magnetic		L:23bit absolute			
④	Inertia Ratio	L: Low	M:Medium	H:High			
⑤	Frame Size	40:40mm	60:60mm	80:80mm	110:110mm	130:130mm	
⑥	Motor Form						
	NO	Shaft Form		Brake		Oil Seal	
		Circular shaft	Keyhole	Install	None	Install	None
	A	●		●		●	
	B	●			●	●	
	C	●		●			●
	D	●			●		●
	E		●	●		●	
	F		●		●	●	
G		●	●			●	
H		●		●		●	
⑦	Plug Type	SS:Plastic plug H:Big size aviation plug		HS:Small size HH:Injection plug			

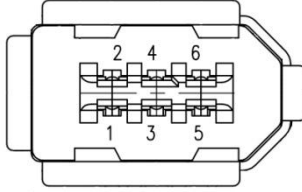
## Connectors and Pin Assignment

### Signal Explanation of Control Signal Port-CN1

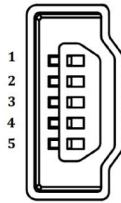
Port		Pin	Signal	I/O	Name	Explanation
CN1		1	COM_SI	input	Digital input common terminal, Com+/Com-, 12VDC~24VDC	Two-way digital input with common terminal, function can be configured. 12VDC ~ 24VDC
		2	SI1	input	Digital input 1	
		7	SI2	input	Digital input 2	
		8	SI3	input	Digital input 3	
		9	SI4	input	Digital input 4	
		10	SI5	input	Digital input 5	
		11	SI6	input	Digital input 6	
		12	SI7	input	Digital input 7	
		13	SI8	input	Digital input 8	
		14	SI9	input	Digital input 9	
		31	COM_SO	output	Digital output common-	Low resistor output in default . OC, the maximum voltage/current is no more than 30V, 50mA . Recommended voltage : 12 V-24V. Current :10mA
		33	SO1 +	output	Digital output 1	
		32	SO2 +	output	Digital output 2	
		34	SO3 +	output	Digital output 3	
		35	SO4 +	output	Digital output 4	Differential Digital output , the maximum voltage/current is no more than 30V, 50mA . Recommended voltage : 12 V-24V. Current :10mA
		18	SO5 +	output	Differential Digital output 5	
		19	SO5-	output		
		20	SO6-	output	Differential Digital output 6	Differential output, High >= 2.5vdc, low <= 0.5vdc, maximum current ±20mA
		21	SO6 +	output		
		23	A +	output	Differential output terminal of motor encoder A phase	
		24	A -	output	Differential output terminal of motor encoder B phase	
		25	B +	output		
		26	B -	output	Differential output terminal of motor encoder Z phase	
		27	Z +	output		
		28	Z -	output	OC output terminal of motor encoder A phase	
		36	OCA	output		
		37	OCB	output		OC output terminal of motor encoder B phase
		29	OCZ	output	OC output terminal of motor encoder Z phase	
		30	GND	output	OC output GND terminal of motor encoder	
		3	PUL +	input	Pulse input, PUL+ and PUL-: 5V differential input PUL+_24 and PUL-: 24V differential input	
		4	PUL -	input		
16	PUL +_24	input				
5	DIR +	input	Direction input , DIR+ and DIR- : 5V differential input DIR+_24 and DIR- : 24V differential input			
6	DIR -	input				
17	DIR +_24	input				
39	AI1+	input	Analog input 1, voltage input range : 10VDC~10VDC , input			

	40	AI1-	input	Analog input 3, voltage input range : 10VDC~10VDC , input resistor 20KΩ
	41	AGND	input	
	43	AI3 +	input	
	44	AI3 -	input	
	15/22/38/40/42	NC	/	Not connection
	Shell	FG		Shield ground

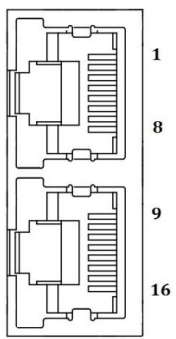
**Encoder Input Port-CN2 for EL7 Series**

Port		Pin	Signal
CN2		1	VCC5V
		2	GND
		3	BAT+
		4	BAT-
		5	SD+
		6	SD-
			PE

**Communication Port-CN6 for EL7 Series**

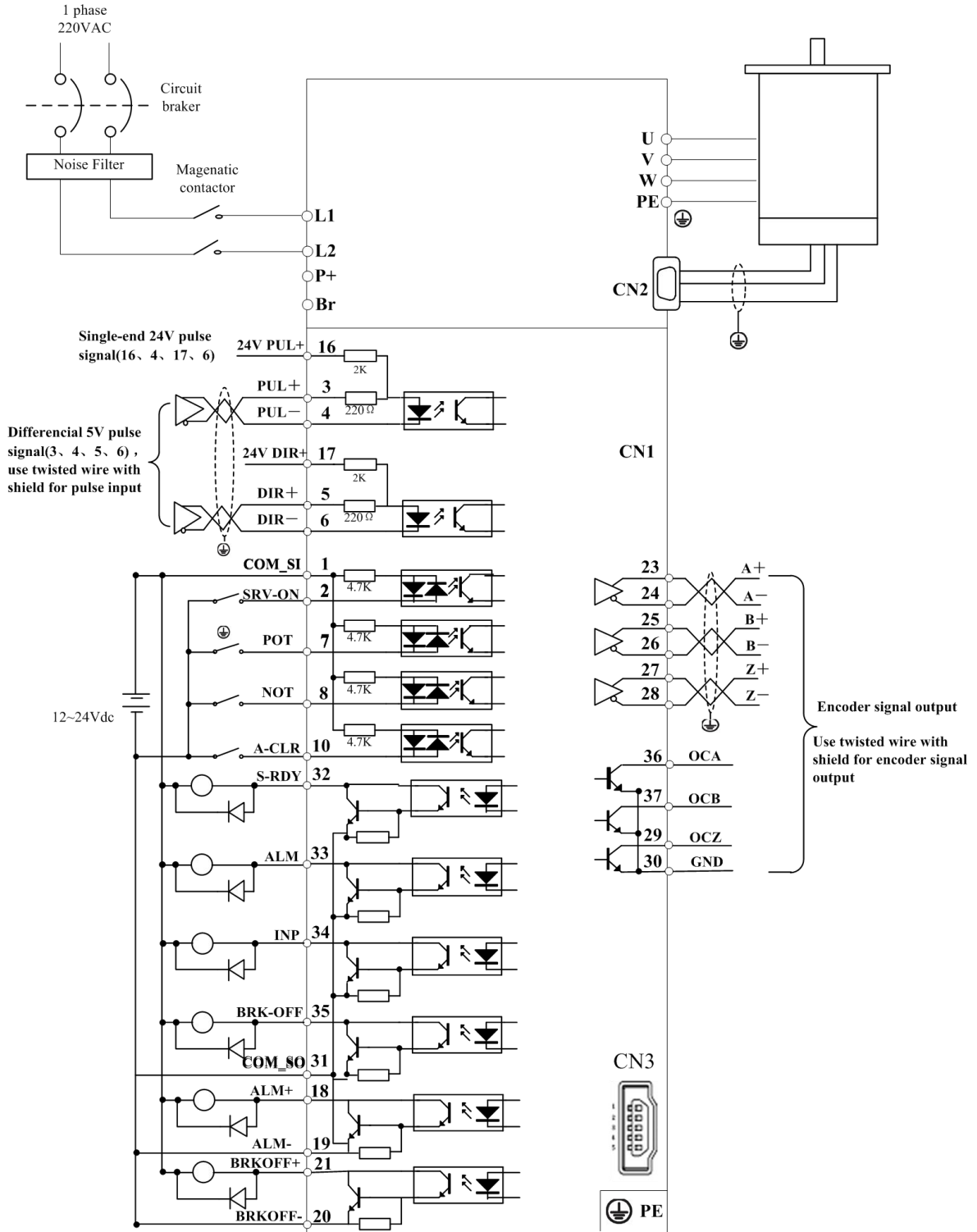
Port		Pin	Signal
CN3		1	VCC5V
		2	D+
		3	D-
		4	
		5	GND
		FG	USB_GND

**Bus connector- CN3 for EL7 Series**

Port		Pin	Signal
CN4 CN5		1 , 9	RDO+
		2 , 10	RDO-
		3 , 11	/
		4 , 12	TXD
		5 , 13	RXD
		6 , 14	VCC5V
		7 , 15	GND
		8 , 16	/
			PE

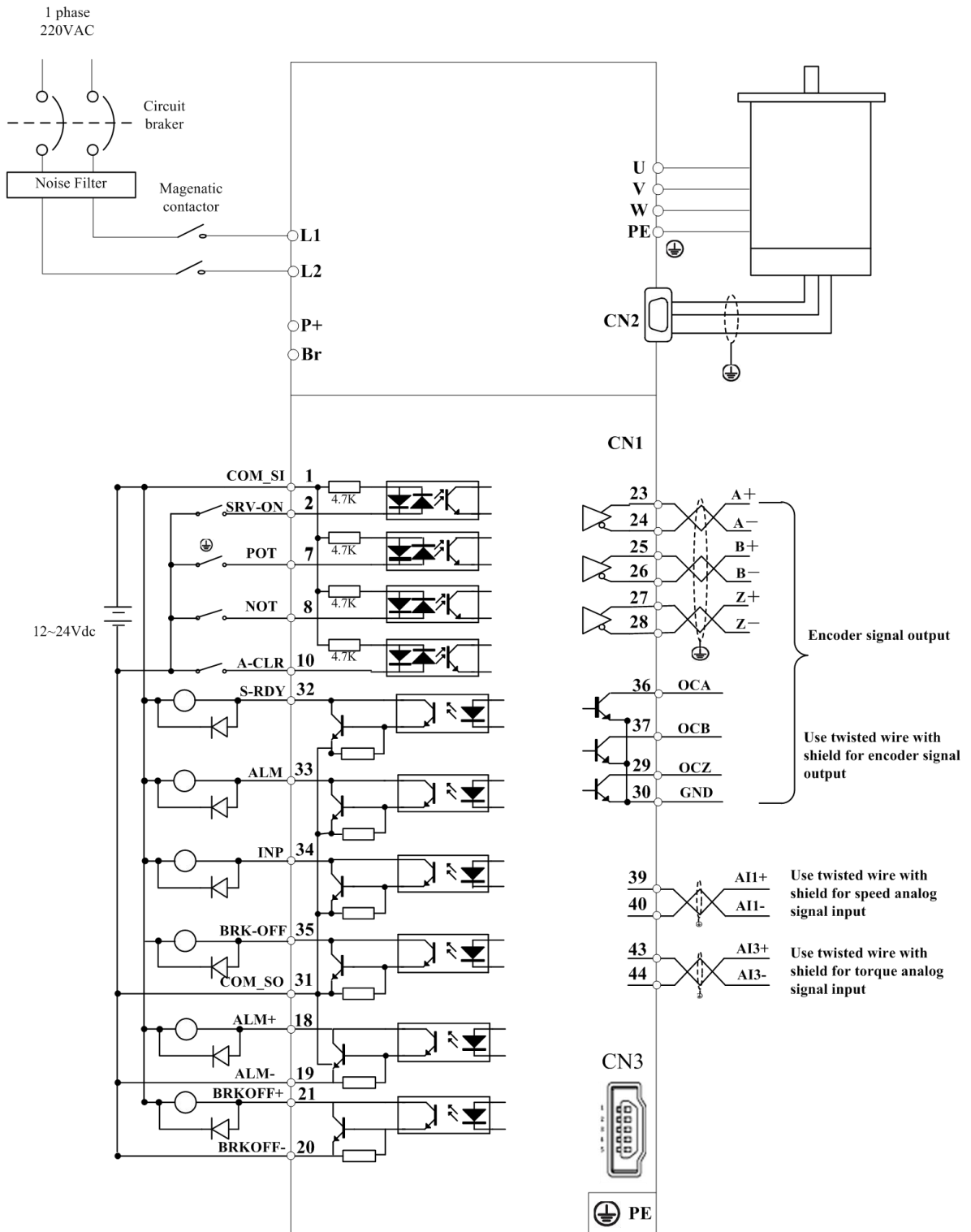
# Wiring

## Position Control Mode



Positional Control Mode Wiring

### Torque /Velocity Control Mode



Torque/Velocity Control Mode Wiring