EL8-EC Series AC Servo Drives - 220V

EL8-EC Series AC Servo Product is a whole new high-end AC servo drivers and motors product range that we have proudly developed at Leadshine Technology Co.,Ltd. EL8-EC series AC servo drivers range from power rating of 450W up to 2000W. Our EL8-EC series AC servo drivers supports EtherCAT communication protocol which can be seamlessly connected to motion controllers (PLC)/drivers that support this standard protocol.

Besides our standard servo driver features such as dynamic braking and internal holding brake which comes with internal regenerative resistor, our EL8-EC drivers now also comes with Safe Torque Off (STO) function, Gantry synchronization, Full Closed Loop functionalities and much more.

Highlights

① Supports 1ph/3ph 220VAC main power supply
② Supports 2nd external encoder
③ Can be connected to position sensor or grating ruler for full closed loop control
④ Equipped with notch filter, damping filter
⑤ Built-in regenerative resistor
⑥ Comes with Safe Torque Off (STO) SIL3
⑦ Motors automatically identified once connected
⑧ 23-bit multiturn magnetic/optical encoder
⑨ Whole new front panel with warning indicator

Technical Specification

EL8-EC Series Driver		EL8-EC400F	EL8-EC750F	L8EC-1000F	EL8-EC1500F	EL8-EC2000F
Power Rating		400W	750W	1000W	1500W	2000W
Rated Current (A)		2.8	5.5	7.0	9.5	12
Peak Current (A)		9.3	16.9	21.2	31.1	36
Control circuit power supply		1-Ph AC 200V-240V, -10% - +10%, 50/60Hz				
Main power supply		1-Ph/3-Ph AC 200V-240V,-10% - +10%, 50/60Hz				
Regenerative resistor	Resistance(Ω)	100	50		50	
	Power rating(W)	50	75		80	
Cooling method		Air-cooled	Fan-cooled			
Dimension H*L*W(mm)		150*150*43	150*160*55		168*183*80	

Ports	Descriptions
USB Type-C	Modify / read driver parameters without connecting to main power supply
Crossover Frequency Output	Supports phase A/B/Z differential crossover frequency output Supports phase Z open collector crossover frequency output
Analog Input	2 analog inputs（AI1/AI2）,-10V~+10V, Max. voltage: ±12V
Analog Output	2 analog outputs（AO1/AO2）, -10V~+10V
Digital Input	8 Digital Inputs (Supports common anode or cathode connection)
	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（3 double-ended, DO1~DO3）	
	1. Alarm (ALM) 2. Servo ready (SRDY) 3. External brake off (BRK-OFF) 4. Positioning completed (INP) 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) 14. Position comparison (CMP-OUT)	
Safe Torque Off (STO)	Available for all EL8-ECF series servo drives	
Encoder #2		
Holding brake	Internal holding brake. External relay not needed	
Communication Port	EtherCAT Protocol, RJ45 port	
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)	
Control Features		
Drive Mode	IGBT SVPWM sinusoidal wave drive	
Feedback Method	Encoder: RS485 Protocol	
Standardized Parameters	Quick tuning of servo driver parameters can be achieved through PC tuning tools.	
Easy-to-use	One-click tuning, Single parameter tuning, Black box, Zero tracking control	
Notch Filter	Mechanical resonance suppression. Supports up to 3 filters,50Hz~4000Hz	
Vibration suppression	End vibration suppression	
DI/DO settings	Digital inputs and outputs can be set accordingly	
Alarm	Overcurrent. Overvoltage. Undervoltage. Overheat. Overload. Overtravel. Single-Phasing. Regenerative resistor error. Position deviation error. Encoder feedback error. Excessive braking rate. EEPROM error	
Front Panel	5 push buttons, 8-segments display, 5 warning LEDs	
Software	Driver tuning through **Motion Studio** Ver. 2.2.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	
Communication	**USB Type-C**	Modbus USB2.0 (No need to connect driver to power supply)
	EtherCAT	RJ45. Communication up to 128 axes to a host
Dynamic Brake	Internal dynamic brake	
Position Comparison	42 position comparison outputs	
Suitable Load Inertia	30 times smaller than motor inertia	
Environmental requirements		
Temperature	Storage: -20-80℃ (Condensation free); Installation: 0-55℃ (Not frozen)	

Humidity	Under 90%RH (Condensation free)
Altitude	Up to 1000m above sea level
Vibration	Less than 0.5G (4.9m/s2) 10-60Hz (non-continuous working)
IP ratings	IP20

Servo Drive Features

Auto gain adjustment
Measure real time mechanical stiffness and set gain values automatically.
Easy tuning functions
Single Parameter Tuning / One-Click Tuning available for uncomplicated setup operations.
Full closed loop control
Supports external position sensor for more precise positioning control.
Gain switching/3rd 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.
Zero tracking control
Able to realize a zero position deviation during acceleration/deceleration.
Friction compensation
Compensate for changes in load to reduce the effect of friction on motion.

Model Name Structure

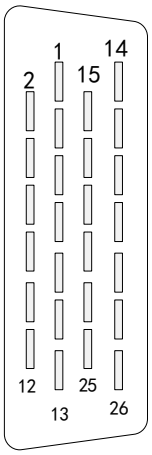
EL8 EC - 400 F - □

① ② ③ ④ ⑤

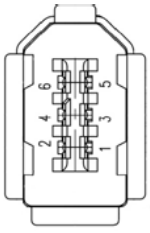
No.	Description	
①	Series No.	EL8：EL8 AC Servo Drive Series
②	Communication protocol	RS ： Pulse train + RS485 EC：EtherCAT
③	Power Rating	400：400W 750：750W 1000:1000W 1500：1500W 2000: 2000W
④	Type	F: Full functions
⑤	Extra(customized)	Blank: Standard

Ports and connectors

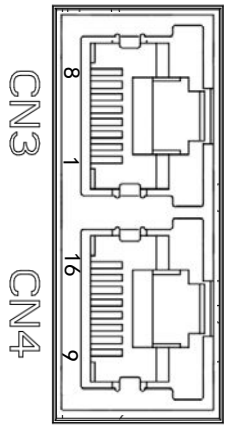
I/O signal CN1

Port	Diagram	Pin	Label	Signal	Description	
CN1		6	DI-COM	Input	Common digital input	
		5	DI1	-	Digital input 1	
		7	DI2	POT	Positive limit switch	
		8	DI3	NOT	Negative limit switch	
		9	DI4	HOME-SWITCH	Homing switch	
		10	DI5	-	Digital input 5	Supports probe latching compensation
		11	DI6	-	Digital input 6	
		12	DI7	-	Digital input 7	
		13	DI8	-	Digital input 8	
		1	DO1+	BRK-OFF+	External brake released signal	
		2	DO1-	BRK-OFF-		
		25	DO2+	S-RDY+	Servo ready signal output	
		26	DO2-	S-RDY-		
		3	DO3+	ALM+	Alarm output	
		4	DO3-	ALM-		
		17	A+	Differential output	Phase A crossover frequency output	
		18	A-			
		20	B+		Phase B crossover frequency output	
		19	B-			
		21	Z+		Phase Z crossover frequency output	
		22	Z-			
		16	GND	Signal ground	Signal ground	
		14	AI1+	AI1	Analog input 1	
		15	AI1-			
		16	AI2+	AI2	Analog input 2	
		17	AI2-			
		Frame		FG	Ground	

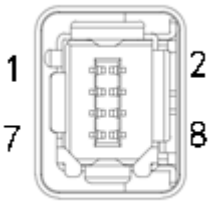
Encoder #1 (Motor) CN2

Port	Diagram	Pin	Signal	Explanation
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

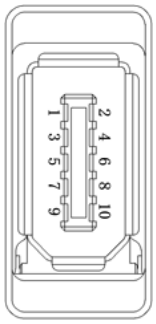
EtherCAT communication port CN3/CN4

Port	Diagram	Pin	Signal	Description
CN3 CN4		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	Shielding grounded

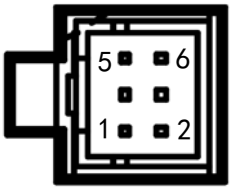
Safe Torque Off (STO) Port

Port	Pin	Signal	Description	Remarks
	1	24V	24v power supply	Connect to SF1 and SF2 when not in use. Do not use to supply power.
	2	0V	Reference ground	
	3	SF1-	Control signal 1 negative input	When SF1 = OFF or SF2 = OFF,STO is enabled.
	4	SF1+	Control signal 1 positive input	
	5	SF2-	Control signal 2 negative input	
	6	SF2+	Control signal 2 positive input	
	7	EDM-	External monitoring device (EDM) with differential double ended output	When SF1 = OFF and SF2 = OFF,EDM = ON
	8	EDM+		

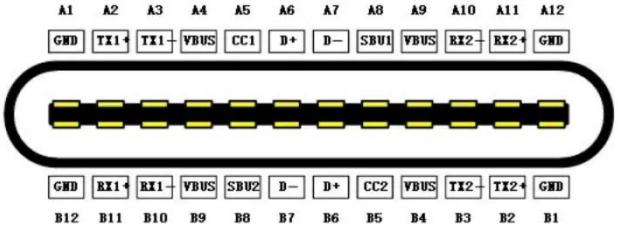
Encoder #2 (External) CN7

Port	Diagram	Pin	Signal	Description
CN7		1	5V	Power supply 5V
		2	GND	Power supply ground
		3	A+	Phase A+ pulse input
		4	A-	Phase A- pulse input
		5	B+	Phase B+ pulse input
		6	B-	Phase B- pulse input
		7	Z+	Phase Z+ pulse input
		8	Z-	Phase Z- pulse input
		Frame	FG	Shield grounding

Analog and Z-phase open collector output CN8

Port	Diagram	Pin	Signal	Description	Remarks
CN8		1	AO1	Analog output 1	
		2	GND	Signal ground	
		3	AO2	Analog output 2	
		4	GND	Signal ground	
		5	OCZ	Z-Phase open collector output	Only NPN Open collector output
		6	GND	Signal ground	

USB Type-C tuning port

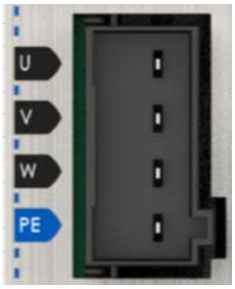


Port	Pin	Signal	Description
USB Type-C	A4, B4,A9, B9	VCC 5V	Power supply positive terminal 5V
	A12,B12,A1,B1	GND	Power supply negative terminal
	A6,B6	D+	USB data positive terminal
	A7,B7	D-	USB data negative terminal
	Frame	USB_GND	Ground through capacitor

Main/Control circuit power supply X1

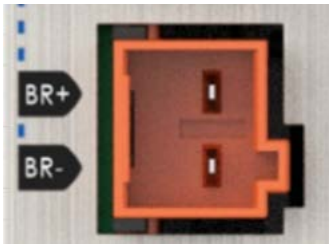
Pin	Label	Explanation	Remarks
L1C	Control circuit L1	Control circuit power supply. Single phase 220VAC	① Optional isolated switching power supply; ② Connecting to 380VAC will cause damage to driver; ③ Line filter is suggested in environment with strong interference; Use a fuseless circuit breaker to turn on/off power supply to driver.
L2C	Control circuit L2		
L1	Main power supply L1	Single phase 220VAC. Supports 1ph/3ph 220VAC,-10%～+10%,50/60Hz	
L2	Main power supply L2		
L3	Main power supply L3		
P +	DC Bus positive terminal	1. Internal DC bus positive terminal 2、External regenerative resistor P terminal	Connect B1 and B2 to use internal regenerative resistor If an external regenerative resistor is needed, connect it to P+ and B2, disconnect B1 and B2.
B1	Regenerative resistor terminal	Internal regenerative resistant drawing terminal	
B2	Regenerative resistor terminal	Internal IGBT transistor	
N	DC Bus negative terminal	Internal DC bus negative terminal	Please don't connect to any cable

Motor Power Supply X2



Pin	Label	Explanation	Remarks
U	U terminal	To motor U terminal	① Please make sure U, V, W terminals of driver and motor are correctly connected. ② Connect motor PE to driver PE and ground.
V	V terminal	To motor V terminal	
W	W terminal	To motor W terminal	
PE	PE	Motor frame	

Holding Brake X3



Pin	Label	Explanation
BR+ （BR1）	Brake positive terminal	Connect to external power supply 24v negative terminal
BR- (BR2)	Brake negative terminal	Connect to motor brake terminal 0V

EL8-RS Series AC Servo Drives – 220VAC

EL8-RS Series AC Servo Product is a whole new high-end AC servo drivers and motors product range that we have proudly developed at Leadshine Technology Co.,Ltd. EL8-RS series AC servo drivers range from power rating of 450W up to 2000W with matching servo motors from 50W up to 2000W.

EL8-RS Series AC Servo Drives support Modbus RS485 communication protocol. This servo drive series can be controlled using analogue input signal, pulse command input and RS485 communication.

Our new EL8-RS Series AC Servo Drive is equipped with easy servo tuning (One-click Tuning/ Single Parameter Tuning), better auto gain adjustments, vibration suppression and many more. We have not only upgraded the existing functionalities but also added in new features such as Gantry synchronization, full closed loop control and black box.

Highlights

① Supports 1ph/3ph 220VAC main power supply
② Frequency response up to 3.5kHz
③ I/Os: 10 DI, 6 DO, 3 AI, 2 AO
④ Pulse input: High speed – 4MHz, Low speed – 200kHz(24V), 500kHz(5V)
⑤ Supports 2nd external encoder
⑥ Comes with Safe Torque Off (STO) SIL3
⑦ Motors automatically identified once connected
⑧ 23-bit multiturn magnetic/optical encoder
⑨ Whole new front panel with warning indicator
⑩ Up to 16 highly configurable PR paths in PR mode

Technical Specifications

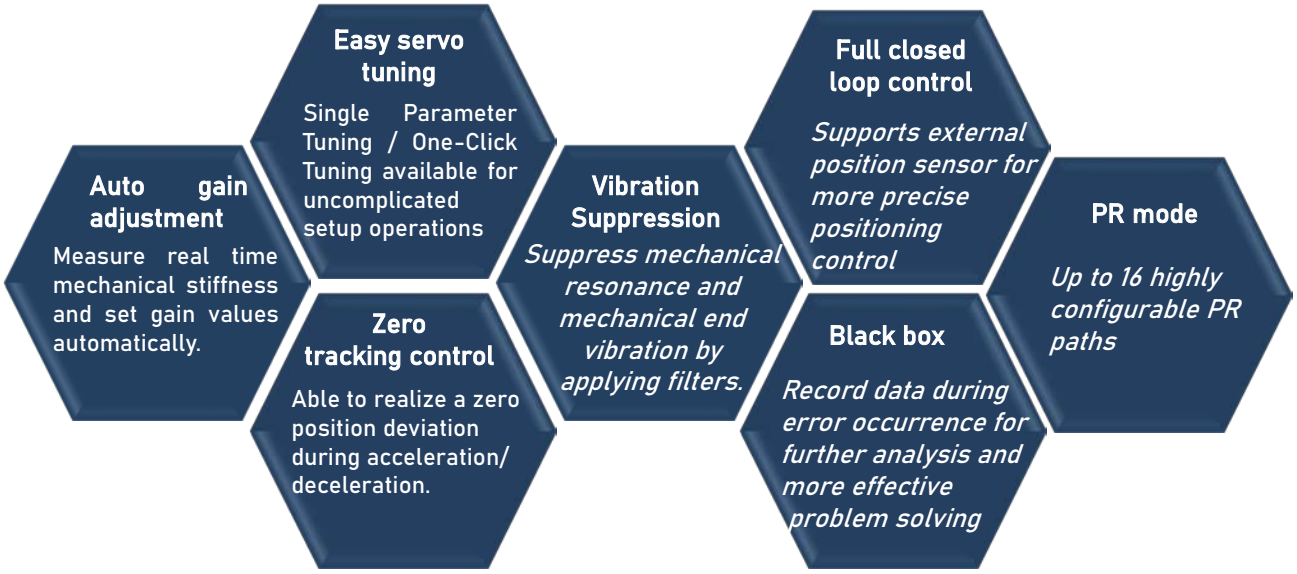
EL8-RS Series Driver		EL8-RS400F	EL8-RS750F	EL8-RS1000F	EL8-RS1500F	EL8-RS2000F
Power Rating		400W	750W	1000W	1500W	2000W
Rated Current (A)		2.8	5.5	7.0	9.5	12
Peak Current (A)		9.3	16.9	21.2	31.1	36
Control circuit power supply		1-Ph AC 200V-240V, -10% - +10%, 50/60Hz				
Main power supply		1-Ph/3-Ph AC 200V-240V,-10% - +10%, 50/60Hz				
Regenerative resistor	Resistance(Ω)	100	50		50	
	Power rating(W)	50	75		80	
Cooling method		Air-cooled	Fan-cooled			
Dimension H*L*W(mm)		150*150*43	150*160*55		168*183*80	

Ports	Descriptions
USB Type-C	Modify or read driver parameters without connecting to main power supply
Crossover Frequency Output	Supports phase A/B/Z differential crossover frequency output Supports phase Z open collector crossover frequency output
Low-speed pulse input	5V differential signal, 0-500kHz 24V differential signal, 0-200kHz
High-speed pulse input	5V differential signal, 0-4MHz
Analog Input	3 analog inputs（AI1/AI2/AI3）,-10V~+10V, Max. voltage: ±12V
Analog Output	2 analog outputs（AO1/AO2）, -10V~+10V

Digital Input	10 Digital Inputs (Supports common anode or cathode connection)
	1. Clear Alarm （A-CLR） 2. Positive limit switch (POT) 3. Negative limit switch (NOT) 4. Gain switching (GAIN) 5. Emergency stop (E-Stop) 6. Deviation counter clearing (CL) 7. Control mode switching (C-MODE) 8. Torque limit switching (TL-SEL) 9. Vibration suppression 1(VS-SEL1) 10. Vibration suppression 2(VS-SEL2) 11. Command prohibition(INH) 12. Internal command velocity 1(INTSPD1) 13. Internal command velocity 2(INTSPD2) 14. Internal command velocity 3(INTSPD3) 15.Crossover frequency input(DIV1) 16. Zero speed clamp(ZEROSPD) 17.Velocity sign(VC-SIGN) 18.Torque sign(TC-SIGN) *Under PR mode* 1. Path trigger (CTRG) 2. Home switch (HOME) 3. Emergency stop trigger(STP) 4. Path 0-3 (ADD0-ADD3) 5. Positive JOG (PJOG) 6. Negative JOG(NJOG) 7. Positive limit switch(PL) 8. Negative limit switch(NL) 9. Origin(ORG)
Digital Output	6 digital outputs（2 single ended, 4 double-ended）
	1. Alarm (ALM) 2. Servo ready (SRDY) 3. External brake off (BRK-OFF) 4. Positioning completed (INP1) 5. Velocity at arrival (AT-SPEED) 6. Zero speed position (ZSP) 7. Velocity coincidence (V-COIN) 8. Position command (P-CMD) 9. Velocity limit (V-LIMIT) 10. Velocity command (V-CMD) 11. Servo enabled (SRV-ST) 12. Positive limit switch(POT-OUT) 13. Negative limit switch (NOT-OUT) *Under PR mode* 1. Command completed (CMD-OK) 2. Path completed (PR-OK) 3. Homing done (HOME-OK)
Safe Torque Off (STO)	Available for all EL8-RS series servo drives
Encoder #2	
Holding brake	Internal holding brake. External relay not needed
Communication Port	Modbus protocol, RJ45 port
Control Mode	
Control	1. External pulse train position control

		2. JOG control 3. Closed loop position control 4. Velocity control 5. Torque control 6. Hybrid control: Position-Torque/Position-Velocity/Velocity-Torque
Pu	Pulse frequency	500kHz/4Mhz(5V differential input);200kHz(24V single-ended input)
	Electronic gear ratio	(1-8388608)/(1-8388608)
	Torque limit	*Please refer to parameter list*
Control Features		
Drive Mode		IGBT SVPWM sinusoidal wave drive
Feedback Method		Encoder: RS485 Protocol
Standardized Parameters		Quick tuning of servo driver parameters can be achieved through PC tuning tools.
Easy-to-use		One-click tuning, Single parameter tuning, Black box, Zero tracking control
Notch Filter		Mechanical resonance suppression. Supports up to 3 filters,50Hz~4000Hz
Vibration suppression		End vibration suppression
DI/DO settings		Digital inputs and outputs can be set accordingly
Alarm		Overcurrent. Overvoltage. Undervoltage. Overheat. Overload. Overtravel. Single-Phasing. Regenerative resistor error. Position deviation error. Encoder feedback error. Excessive braking rate. EEPROM error
Front Panel		5 push buttons, 8-segments display, 5 warning LEDs
Software		Driver tuning through **Motion Studio** Ver. 2.2.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
Communication	USB Type-C	Modbus USB2.0 (No need to connect driver to power supply)
	Modbus	RJ45. Communication up to 32 axes to a host
Dynamic Brake		Internal dynamic brake
Position Comparison		42 position comparison outputs
Suitable Load Inertia		30 times smaller than motor inertia
Environmental requirements		
Temperature		Storage: -20-80℃ (Condensation free); Installation: 0-55℃ (Not frozen)
Humidity		Under 90%RH (Condensation free)
Altitude		Up to 1000m above sea level
Vibration		Less than 0.5G (4.9m/s2) 10-60Hz (non-continuous working)
IP ratings		IP20

Servo Drive Features



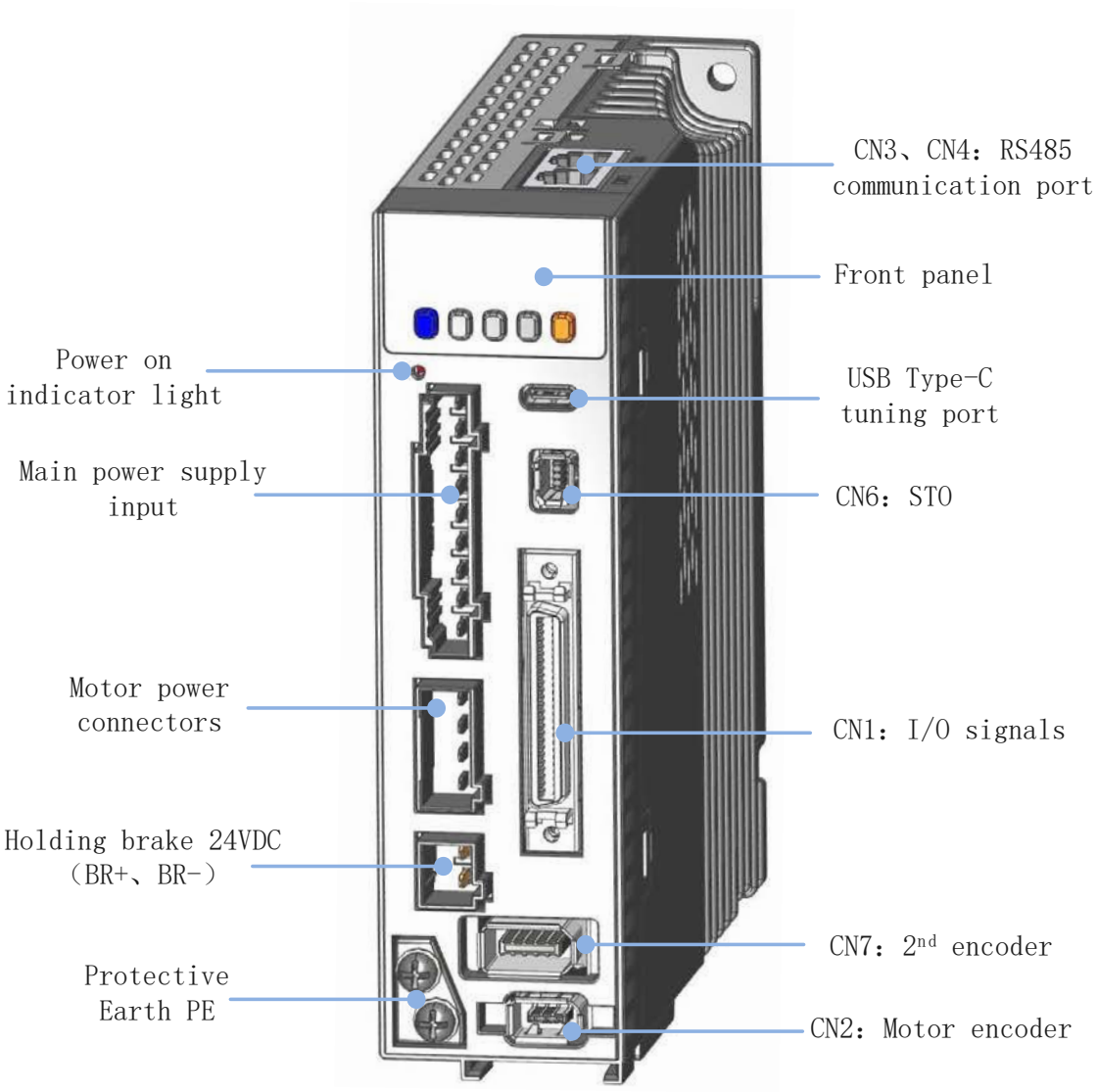
Model Name Structure

EL8 RS - 400 F - □

① ② ③ ④ ⑤

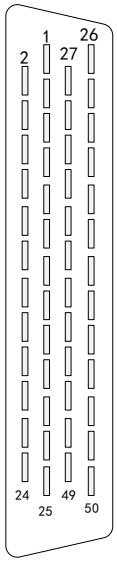
No.	Description	
①	Series No.	EL8：EL8 AC Servo Drive Series
②	Communication protocol	RS ： Pulse train + RS485 + Analogue EC：EtherCAT
③	Power Rating	400：400W 750：750W 1000:1000W 1500：1500W 2000: 2000W
④	Type	F: Full functions
⑤	Extra(customized)	Blank: Standard

Ports and connectors



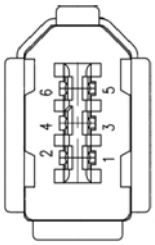
Connector	Label
CN1	I/O signal connector（50PIN）
CN2	Motor encoder feedback
CN3	RS485 Communication port
CN4	RS485 Communication port
CN6	STO Safety Torque Off port
CN7	2nd encoder (external)
X1	Main/Control circuit power supply
X2	Motor power supply
X3	Holding brake terminal
PC	USB type C port

CN1 - I/O Signal

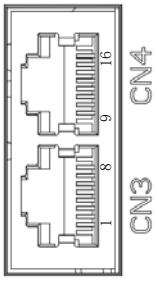
Port	Diagram	Pin	Pin def.	Signal	Description
CN1		1	PUL+24	Pulse train	Low-frequency pulse train direction signal PUL+ & PUL-: 5V differential (500KHz) DIR+ & DIR-: 5V differential (500KHz) PUL+24 & PUL-: 24V single ended (200KHz) DIR+24 & DIR-: 24V single ended (200KHz)
		3	PUL+	Pulse train	
		4	PUL-	Pulse train	
		2	DIR+24	Pulse direction signal	
		5	DIR+	Pulse direction signal	
		6	DIR-	Pulse direction signal	
		44	PULSH+	High-frequency pulse train	4MHz High-frequency pulse train ,5V differential input
		45	PULSH-	High-frequency pulse train	
		46	SIGNH+	High-frequency direction signal	4MHz High-frequency pulse train,5V differential input
		47	SIGNH-	High-frequency direction signal	
		13	GND	GND	Ground
		7	DI-COM	Input	Common digital input
		8	DI1	SRV-ON	Servo driver power on
		9	DI2	POT	Clockwise motion disallowed
		26	DI3	NOT	Anti-clockwise motion disallowed
		27	DI4	GAIN	Gain switching
		28	DI5	DIV1	Command multiplier switching
		29	DI6	CL	Set deviation counter to zero
		30	DI7	A-CLR	Clear alarm(s)
		31	DI8	C-MODE	Control mode switching
		32	DI9	INH	Signal inhibit
		33	DI10	Null	Null
		11	DO1+	BRK-OFF+	Release external brake
		10	DO1-	BRK-OFF-	
		35	DO2+	SRDY+	Servo ready
		34	DO2-	SRDY-	
		37	DO3+	ALM+	Servo driver alarm
		36	DO3-	ALM-	
		39	DO4+	INP1+	Position reached feedback signal
		38	DO4-	INP1-	
		41	DOCOM	Output	Common digital output (Max.current:50mA,Max.voltage 30V)
		12	DO5	ZSP	Velocity zero
		40	DO6	TLC	Limited torque
		14	AI 1+	AI1	Velocity/Velocity limit(0 ~ ±10 V)
		15	AI 1-		
		16	AI 2	AI2	Torque/Torque limit in clockwise direction(0 ~ +10 V)

		17	GND	GND	Analog signal ground
		18	AI 3	AI3	Torque/Torque limit in anti-clockwise direction(-10 ~ 0 V)
		42	AO1	IM	Analog output signal monitoring 1 (Configurable)
		43	AO2	SP	Analog output signal monitoring 2 (Configurable)
		21	A+	Differential output	Encoder channel A pulse frequency
		22	A-	Differential output	
		48	B+	Differential output	Encoder channel B pulse frequency
		49	B-	Differential output	
		23	Z+	Differential output	Encoder channel Z pulse frequency
		24	Z-	Differential output	
		25	GND	GND	Internal ground
		19	OCZ	Channel Z output	Channel Z output (Open collector)
		20	GND	GND	Internal ground
		50	FG	FG	Shield grounding
		Frame		FG	Frame grounding

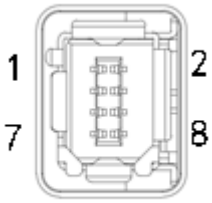
CN2 - Motor Encoder

Port	Diagram	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

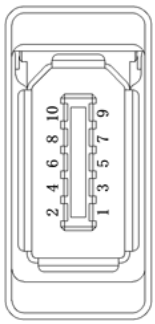
CN3/CN4 - RS485 Communication Port

Port	Diagram	Pin	Signal	Explain
CN3 CN4		1，9	RDO+	RS485 Differential signal+
		2，10	RDO -	RS485 Differential signal-
		3，11	GND	Ground（RS485）
		4，12	TXD+	RS485 Differential signal+
		5，13	TXD-	RS485 Differential signal-
		6	VCC5V	Reserved，5V positive（50mA）
		7，15	GND	Ground
		8，16	/	/
		Frame	PE	Shield grounding

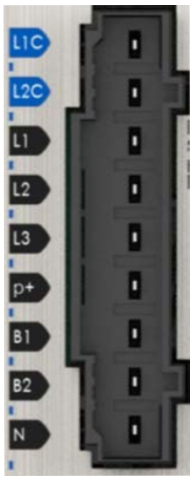
CN6 – Safe Torque Off (STO)

Port	Diagram	Pin	Signal	Description	Remarks
CN6		1	24V	24v power supply	Connect to SF1 and SF2 when not in use. Do not use to supply power.
		2	0V	Reference ground	
		3	SF1-	Control signal 1 negative input	When SF1 = OFF or SF2 = OFF, STO is enabled.
		4	SF1+	Control signal 1 positive input	
		5	SF2 -	Control signal 2 negative input	
		6	SF2+	Control signal 2 positive input	
		7	EDM-	External monitoring device (EDM) with differential double ended output	When SF1 = OFF and SF2 = OFF,EDM = ON
		8	EDM+		

CN7 – 2nd Encoder (External)

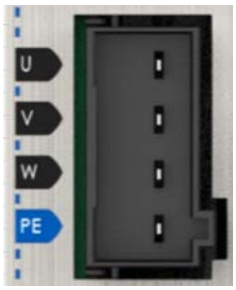
Port	Diagram	Pin	Signal	Description
CN7		1	5V	Power supply 5V
		2	GND	Power supply ground
		3	A+	Phase A+ pulse input
		4	A-	Phase A- pulse input
		5	B+	Phase B+ pulse input
		6	B-	Phase B- pulse input
		7	Z+	Phase Z+ pulse input
		8	Z-	Phase Z- pulse input
		Frame	FG	Shield grounding

X1 – Main/Control Circuit Power Supply



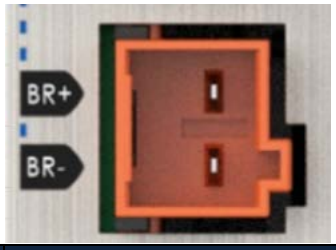
Pin	Label	Description	Remarks
L1C	Control circuit L1	Control circuit power supply. Single phase 220VAC	① Optional isolated switching power supply; ② Connecting to 380VAC will cause damage to driver; ③ Line filter is suggested in environment with strong interference; Use a fuseless circuit breaker to turn on/off power supply to driver.
L2C	Control circuit L2		
L1	Main power supply L1	Single phase 220VAC. Supports 1ph/3ph 220VAC,-10%～+10%,50/60Hz	
L2	Main power supply L2		
L3	Main power supply L3		
P +	DC Bus positive terminal	1. Internal DC bus positive terminal 2、External regenerative resistor P terminal	Connect B1 and B2 to use internal regenerative resistor If an external regenerative resistor is needed, connect it to P+ and B2, disconnect B1 and B2.
B1	Regenerative resistor terminal	Internal regenerative resistant drawing terminal	
B2	Regenerative resistor terminal	Internal IGBT transistor	
N	DC Bus negative terminal	Internal DC bus negative terminal	Please don't connect to any cable

X2 – Motor Power Supply



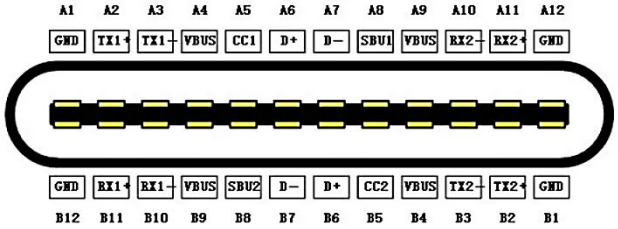
Pin	Label	Description	Remarks
U	U terminal	To motor U terminal	① Please make sure U, V, W terminals of driver and motor are correctly connected. ② Connect motor PE to driver PE and ground.
V	V terminal	To motor V terminal	
W	W terminal	To motor W terminal	
PE	PE	Motor frame	

X3 – Holding Brake



Pin	Label	Description	Remarks
BR+ （BR1）	Brake positive terminal	Connect to external power supply 24v negative terminal	No need of an external relay
BR- (BR2)	Brake negative terminal	Connect to motor brake terminal 0V	

USD Type-C Tuning Port



Port	Pin	Signal	Description
USB Type-C	A4, B4,A9, B9	VCC 5V	Power supply positive terminal 5V
	A12,B12,A1,B1	GND	Power supply negative terminal
	A6,B6	D+	USB data positive terminal
	A7,B7	D-	USB data negative terminal
	Frame	USB_GND	Ground through capacitor

ELM1/ELM2 Series Servo Motor

ELM1 H - 0400 M A 60 F T - □

(1) (2) (3) (4) (5) (6) (7) (8) (9)

(1)Series No.	
ELM1	ELM1 Series servo motor
ELM2	ELM2 Series servo motor

(2)Inertia Ratio	
L	Low
M	Medium
H	High

(3)Power Rating			
0050	50W	2000	2000W
0100	100W	2900	2900W
0200	200W	3000	3000W
0400	400W	4000	4000W
0750	750W	4400	4400W
0850	850W	5000	5000W
1000	1000W	5500	5500W
1300	1300W	7000	7000W
1500	1500W	7500	7500W
1800	1800W		

(4)Encoder Type	
L	23-bit optical multiturn
M	23-bit magnetic multiturn

(5)Rated Speed	
A	3000rpm
B	2500rpm
C	2000rpm
D	1500rpm

(6)Frame Size	
40	40mm
60	60mm
80	80mm
100	100mm
130	130mm
180	180mm

(7)Motor Type	
E	With brake, oil seal
F	No brake, oil seal

(8)Voltage	
Blank	220VAC
T	380VAC

(9Motor Connector	
Blank	Direct Connector
H	Aviation Connector

Motors availability

Power rating(W)		50	100	200	400	750	850	1000	1300	1500	1800	2000
Connector	Direct	■	■	■	■	■		■				
	Aviation						■	■	■	■	■	■
Frame size (mm)	40	■	■									
	60			■	■							
	80					■		■				
	130						■	■	■	■	■	■
Encoder 23-bit	Magnetic	■	■		■	■		■				
	Optical	■	■	■	■	■	■	■	■	■	■	■
Rotational speed (rpm)	1500						■		■		■	
	2500							■		■		■
	3000	■	■	■	■	■		■				

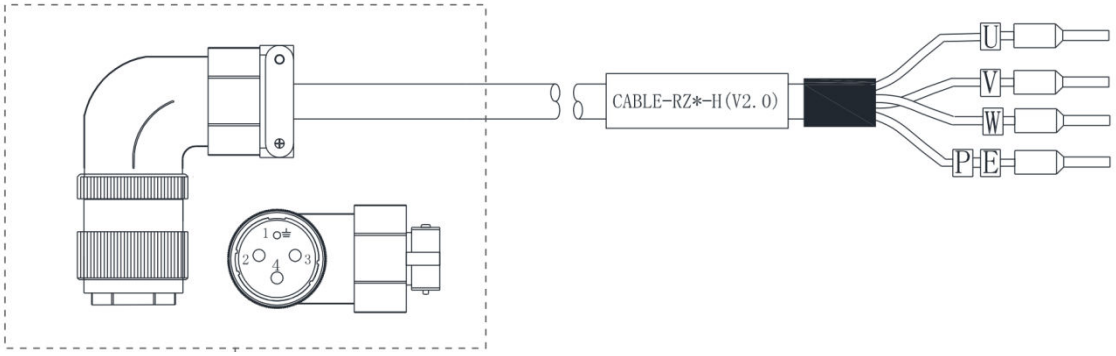
Ready soon!

**All motor models come with optional holding brake.*
***All motors are of high inertia.*
****The table will be updated from time to time as we released new and updated models.*

Cables

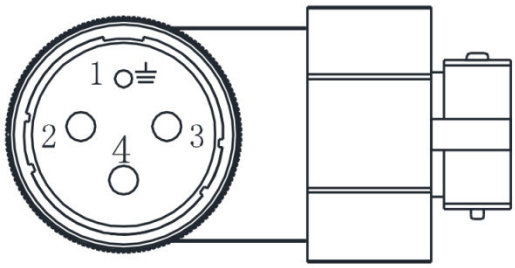
Motor power cable without holding brake

Aviation connector（Frame size 130）CABLE-RZ*H(V1.1/V2.0)



Motor side　　Driver side

Motor cable pin

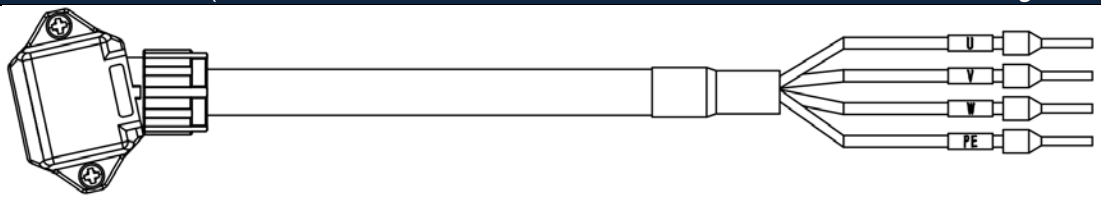


Motor side

Pins

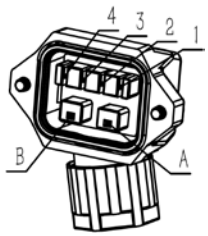
Motor	Color	Driver
1	Red	U
3	Green	V
2	Black	W
4	Yellow	PE

Direct connector(Frame size 80 or below）CABLE-RZH*M*-114-TS *without holding brake*



Motor side　　Driver side

Driver cable pin

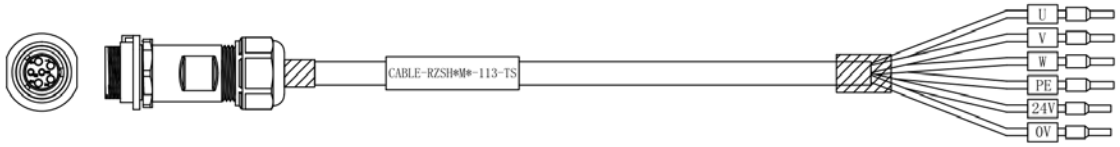


Pins

Motor	Color	Driver
1	Blue	U
2	Black	V
3	Red	W
4	Yellow- green	PE

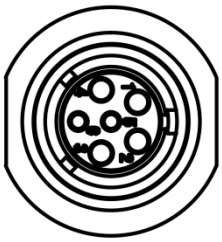
Motor power cable with holding brake

Aviation connector（Frame size 80 or below）CABLE-RZSH*M*-113-TS Winding cable with holding brake



Motor side　　Driver side

Motor cable pin

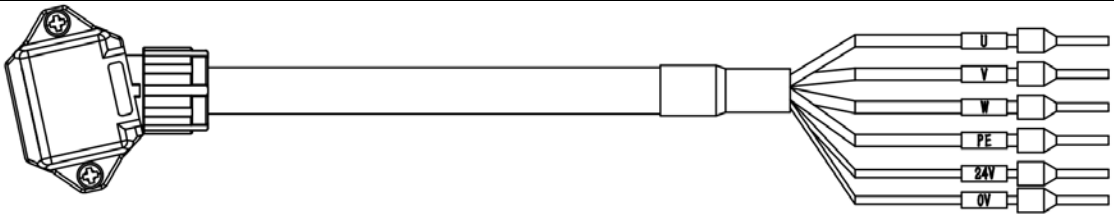


Motor side

Pins

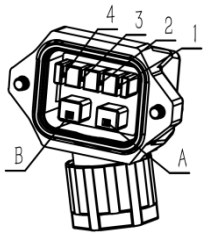
Motor	Color	Driver
1	Blue	U
2	Red	W
3	Black	V
4	Yellow-green	PE
5	Black	0V
6	Red	24V

Direct connector CABLE-RZH*M*-114-TS Winding cable with holding brake



Motor side　　Driver side

Motor cable pin

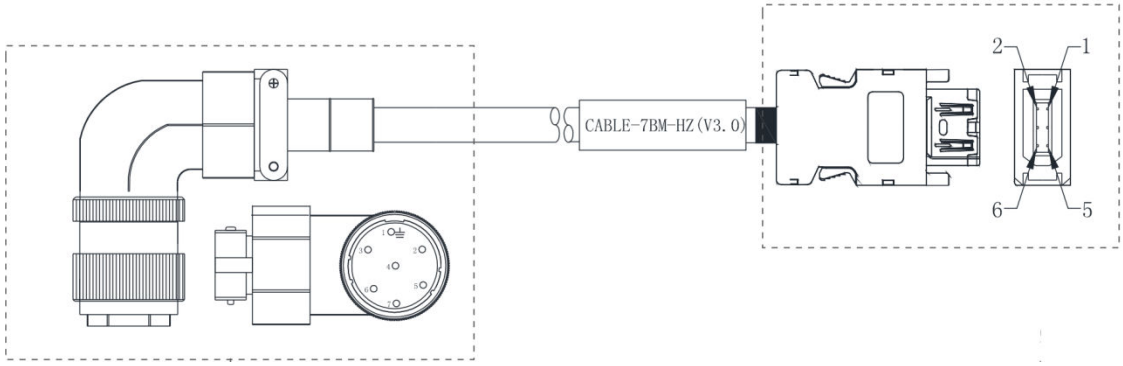


Pin

Motor	Color	Driver
1	Blue	U
2	Black	V
3	Red	W
4	Yellow-green	PE
A	Black	0V
B	Red	24V

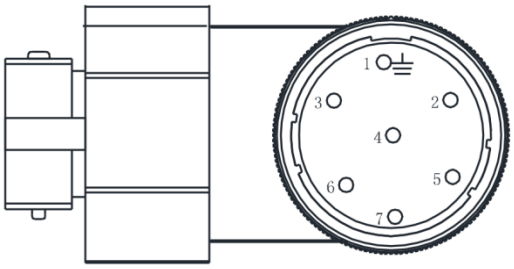
Encoder cable

Aviation connector（Frame size 130）CABLE-7BM*HZ(V3.0)



Motor side　　Driver side

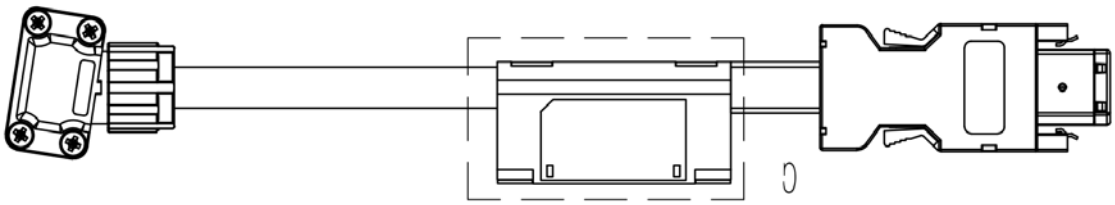
Motor cable pin	Pin



Motor side

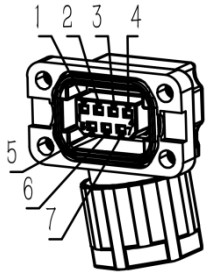
Motor	Driver	Signal
1	Frame	Shielded
2	1	+5V
3	2	0V
4	5	SD+
5	6	SD-
6	3	BAT+
7	4	BAT-

Direct connector(Frame size 80 or below）CABLE-BMH*M*-114-TS Incremental encoder



Motor side　　Driver side

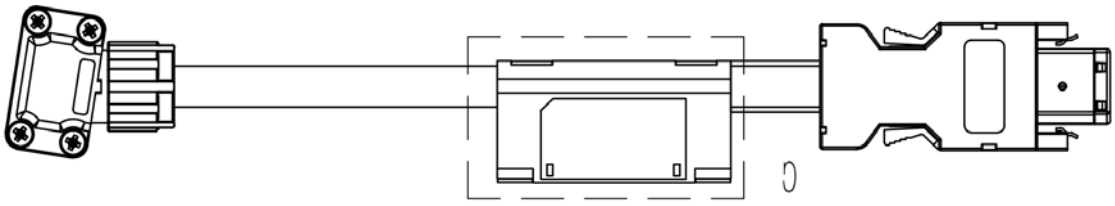
Motor cable pin	Pin



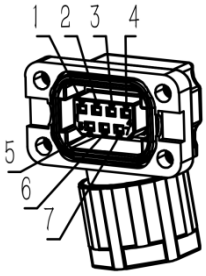
Motor side

Motor	Driver	Signal
1	Frame	Shielded
2	1	+5V
3	2	0V
4	5	SD+
5	6	SD-

Direct connector(Frame size 80 or below）CABLE-BMAH*M*-124-TS Absolute encoder



Motor side　　Driver side

Motor cable pin	Pin
 Motor side	

Motor	Driver	Signal
1	Frame	Shielded
2	1	+5V
3	2	0V
4	5	SD+
5	6	SD-
6	3	BAT+
7	4	BAT-