

CTB MOTOR

经销商



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CTB MOTOR

OPERATING INSTRUCTION

CTB series AC servo motor

PLEASE SEND THIS OPERATING INSTRUCTION TO FINAL
USER FOR SAFE KEEPING



北京超同步伺服股份有限公司
BEIJING CTB TECHNOLOGY CO.,LTD.

REFERENCE NUMBER: ZL-10-0106-IBCN

1、Preamble

CTB-Z series AC servo spindle motor is new type of ac spindle induction servo motor with independent research, design, production and enters international market, which has been reached international leading level.

CTB series servo spindle motor has a compact structure, superior function, good shape and high efficiency, widely used in various fields of machinery manufacturing with very good cost performance. More and more motors have been applied in high performance speed control fields, such as CNC machine tools, plastic cement device, oil extraction equipment, woodworking machinery, printing equipment, shearing equipment etc.

CTB-Z series conformed with some national related technical conditions and IEC,CE standards.

Please read this instruction carefully for purpose of properly using our motor and preserving our products.

When opening package, the product do not confirm to packing list, Please contact with us timely.

2、Storage, transition and installation

2.1 Storage

2.1.1 Keep the dry storage places with air circulation, no flammable gas.

2.1.2 2.1.2 The environmental temperature of storage place shall be between +50℃ to -20℃ .

2.1.3 The environment humidity of motor storage place shall be 20-80%.

2.2 Transition

2.2.1 Do not open package, avoid rain and strenuous vibration in transition.

2.2.2 Lift and put down lightly, no bump in transition.

2.2.3 No shaft extension and fan stress in transition.

2.3 Installation

2.3.1 Shall check whether the motor mark accord with contract, technical requirements of complete system.

2.3.2 Inspect whether fasteners come loose, components damage.

2.3.3 If lay down too long, shall use tramegger to check the electrical insulation resistance, not lower than listed value in this table.

Environmental temperature	10-15	15-25	25-35	35-40
Electrical insulation resistance	≥ 50	≥ 36	≥ 30	≥ 20

Note: If the testing value is lower than table value, shall make drying process or contact with manufacturer.

9、Other

9.1 Motor mounting size and performance parameters please check our company sample catalogue.

9.2 This instruction used for maintenance and usage, any doubts please call us.

9.3 Any changes of content, without separate notice.

10、Product qualification certificate



Product qualification certificate

Product name: AC servo motor (Z-series)

Product model: CTB-

Product No:

Inspector:

Date of production:

Beijing CTB technology Co.Ltd

8、The common faults and processing solutions

Fault phenomenon	possible cause	maintenance methods
Motor fail to start	power phase shortage	Check power
	Low voltage	Check power
	load failure	Check load device
	Motor connecting wire failure	Check motor connecting wire
	Driver connecting wire failure	Check driver connecting wire
	Drive parameter settings not appropriate	Adjust driver settings
Motor vibrate	Coupling loose	Fix the coupling screw nut
	Install base uneven or defective	Check base and fasten
	Rotor, Belt wheel unbalanced	whole machine balancing test
	Shaft extension hit with deformation	Shaft extension adjustment, or replace if necessary
Motor speed is lower than defined value	Low power voltage	Check power voltage
	Overload	Check drive mechanism
	Encoder damage	Check encoder
	driver parameter adjustment improperly	Change driver parameters
Motor noise	mechanical friction	Check drive mechanism
	phase-deficient operation	Check power or converter
	Bearing damage	Replace bearing
	Encoder damage	Replace encoder
Motor shell electric leakage	Bad earth	Check earth bolt and fix
	Winding affected with damp, low insulation	Dry, replace if necessary
	Bad earth	Clean wiring board
	Lead wire insulation worn out	Deal with insulation
	Fan electric leakage	Repair fan
Motor overheat	Abnormal power voltage	Check power
	Overload	Check drive mechanism
	ventilation obstructed	Check fan and wind channel
	Short circuit of Motor inter-turn or inter-phase	Check the no-load current
	Improper driver parameters	Adjust driver parameters
	Motor mounting failure	Check coupling
	Bearing damage	Replace bearing
unsteady operation	Encoder damage	Replace encoder
	Loose encoder connection wire	Retighten cable socket plug
	Driver failure	Adjust driver parameters

- 2.3.4 Use belt transmission load device should assure axis central line of the motor is parallel with the input shaft central line of mechanical device, belt central line is vertical with axis central line.
- 2.3.5 When vertical installation, except for connecting device, no equipped with other axial load device.
- 2.3.6 Guarantee good air condition of motor.
- 2.3.7 Ensure that the ground terminal in motor terminal box shall be properly grounded.
- 2.3.8 It is forbidden for axially tapping motor or motor shaft axial load in avoid of encoder and bearing damage.
- 2.3.9 2.3.9 For motor with fan, Shall provide fan power separately.

3、 Usage and maintenance

3.1 Usage

- 3.1.1 U.V.W terminator of motor must be joined with U.V.W terminator of driver in the manner of one-to-one correspondence connection.
- 3.1.2 The encoder cable plug must be firm plug-in, encoder cable fastening clamp in connection wire box shall be tighten to prescribed position.
- 3.1.3 Ensure that wind direction(rotating direction) accord with label.
- 3.1.4 Motor operating smoothly, no abnormal noise.
- 3.1.5 When changing motor rotating direction, can exchange phase sequence of motor power wire (exchange A. B phase of encoder) or by adjusting parameters of frequency converter, servo driver.
- 3.1.6 Ensure cooling fan in normal operation when motor is in adjusting speed running.
- 3.1.7 Do not touch motor surface with hand lest scalding when motor running.

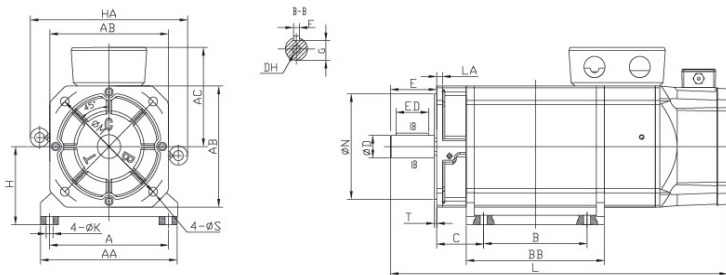
3.2 Maintenance

- 3.2.1 Clear motor surface and blocking materials in air-vent frequently.
- 3.2.2 Deterioration of motor bearing lubricating grease due to some causes and motor overheat shall replace bearing timely.
- 3.2.3 When bearing life comes to end, operation vibration and motor noise become obviously, shall replace motor timely.
- 3.2.4 If motor windings are broken or low insulation resistance, Please contact with production manufacturer.

7、Motor outline shape and installation

7.1 Shape outline and mounting size of standard motor

7.1.1 Standard motor outline shape and installation figure



7.1.2 Standard motor Outline shape and installation size table

	L	B	BB	C	DH	HA	LA	A	AA	AB	AC	D	E	ED	F	G	H	K	M	N	S	T
ZA1	378	33	93	82	M10	255	11	190	212	180	154	28	60	45	8	24	112	12	185	150	11	4
ZA2	388	43	103																			
ZA3	413	68	128																			
ZA4	463	118	178																			
ZB1	475	73	133	81	M12	300	14	216	236	204	166	38	80	60	10	33	132	12	215	180	15	4
ZB2	530	128	188																			
ZB3	580	178	238																			
ZB4	610	208	268																			
ZC1	581	112	180	92	M16	346	15	254	292	250	189	42	110	90	12	37	160	15	265	230	15	4
ZC2	611	142	210																			
ZC3	661	192	260																			
ZC4	711	242	310																			
ZD1	683	198	266	97	M20	402	20	279	349	300	214	55	110	90	16	49	180	15	325	280	19	5
ZD2	723	238	306																			
ZD3	753	268	336																			
ZD4	783	298	366																			
ZE1	800	177	295	149	M20	380	23	356	435	380	275	60	140	110	18	53	225	19	400	350	19	5
ZE2	840	217	295																			
ZE3	930	150	390																			
ZE4	1000	158	390																			
ZF1	920	214	330	168	M20	470	23	457	550	470	320	80	170	140	22	71	280	24	500	450	19	5
ZF2	970	264	330																			
ZF3	1030	162	390																			
ZF4	1100	150	390																			
Remarks	If need equipped with brake, need increase length on basis of original total length "L" ZA base:60, ZB base: 70, ZC base:90, ZD base:100.																					

Note:1.Motor base" ZE1-ZF4" flange mounting hole" S" is 8 hole,centric angle between two holes is 18 degrees quartering.

2.Motor base" ZE3、ZE4、ZF3、ZF4" earth foot mounting hole " K" is 6 hole, centric distance between two holes " B" is "B" size in this table.

3.Size in this table is mm

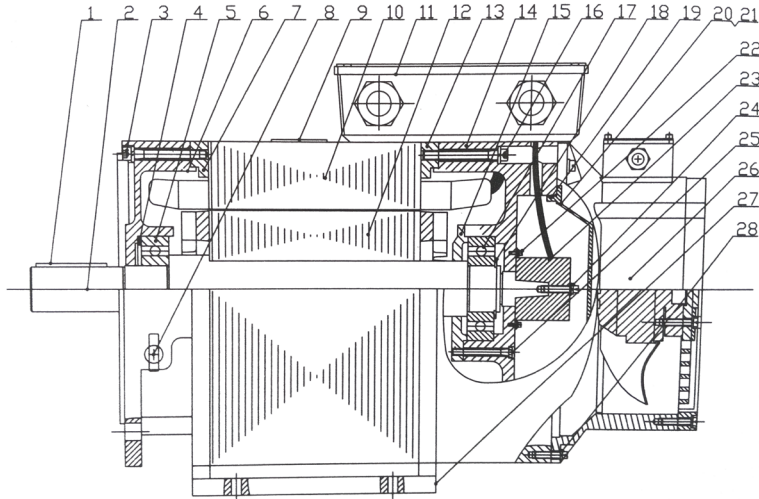
*Size is subject to change without prior notice.

Model	Name	Description	Catalog Number Explanation
1	Plant code	CTB CTB plant motor code	CTB company product
2	Voltage class	Code Voltage class Code Voltage class 2 220V class 4 380V class	380V class
3	Power code	See standard specification table	7.5KW
4	Motor type code	Z; spindle motor	Z; spindle motor
5	Encoder code	Code: encoder type B: no encoder G: incremental encoder 1024P, 2500p, 6000P, 8192P R: rotary transformer 1024P, 12bit S: Sin-cos encoder: 2048P A: absolute value encoder 13bit, 17bit, 21bi	Built-in incremental encoder
6	Frame size code	Frame size code flange size(length x width)mm A:180x180 AP:165x165 B:204x204 BP:204x204 C:250x250 CP:265x265 D:300x300 DP:320x320 E:380x380 F:470x470 G:620x620	B motor base
7	Basic rotate speed code	Code rotate speed r/min Code rotate speed r/min 05: 500 45: 4500 07: 750 60: 6000 10: 1000 80: 8000 15: 1500 90: 9000 20: 2000 A0: 10000 30: 3000 A2: 12000 40: 4000 A5: 15000	Basic rotate speed:1500r/min
8	High rotate speed code	Code rotate speed r/min L:3000 M:6000 H:8000 HF:10000(A B motor base) F:12000(A B motor base) FF:15000(A B motor base)	Highest rotate speed:8000 r/min
9	Installation method code	Code: Installation method 3: horizontally-mounted 5: flanged mounting 35: horizontally-flanged mounting	flanged mounting
10	Shaft extension structure code	G: optical axis J: key slot	Optical axis
11	Brake optional item	B: brake	brake

5.2 Power code table(1.1kw-315kw)

Power code	power	Power code	power	Power code	power
1P1	1.1KW	013	13KW	055	55KW
15P	1.5KW	015	15KW	060	60KW
2P2	2.2KW	018	18.5KW	065	65KW
3P7	3.7KW	022	22KW	075	75KW
5P5	5.5KW	026	26KW	090	90KW
7P5	7.5KW	030	30KW	110	110KW
9P5	9.5KW	037	37KW	132	132KW
011	11KW	045	45KW	315	315KW

4、 Motor structure instruction



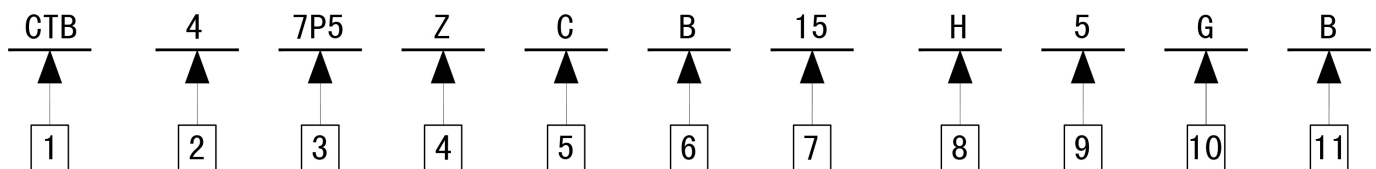
Part description:

1. Key slot	2. Shaft extension	3. Front end cover bolt	4. Corrugated sheet
5. Front bearing	6. Front end cover	7. Front end plate	8. Lifting ring
9. Nameplate	10. Stator core	11. Connection wire box	12. Rotor
13. Rear end plate	14. Rear end cover	15. Bearing cover	16. Fastening bolt of rear end cover
17. Rear bearing	18. Clamp spring	19. Seal ring	20. Seal cover
21. Seal cover	22. Encoder Screw nut	23. Encoder	24. Encoder Screw nut

5、 Motor nameplate instruction

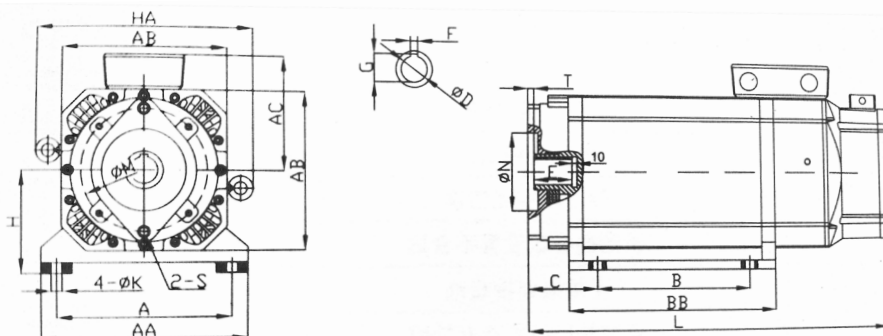
5.1 Motor type instruction

CTB-47P5ZCB15-H5GB



7.2 Outline shape and mounting size of inner shaft motor

7.2.1 Inner shaft motor outline shape and mounting figure



7.2.2 Inner shaft motor outline shape and mounting size table

Frame size	L	B	BB	A	AA	AB	AC	C	D	E	F	G	H	HA	K	M	N	S	T
ZB3	524	178	238	216	236	204	166	105	32	50	10	35.3	132	300	12	146	101.6	M12	11
ZB4	554	208	268																
ZC2	538	142	210	254	292	250	189	129	40	75	12	43.3	160	346	15	181	127.0	M16	11
ZC3	588	192	260																
ZD1	589	198	266	279	349	300	214	113	50	75	14	53.8	180	402	15	229	152.4	M20	11
ZD2	629	238	306																
ZD3	659	268	336																
ZD4	689	298	366																

7.3 Frame size、type table

Frame size	Include motor				Frame size	Include motor	
ZA1	—	41P1ZA15	41P5ZA20	42P2ZA30	ZE1	4026ZE10	1037ZE15
ZA2	41P1ZA10	41P5ZA15	42P2ZA20	43P7ZA30	ZE2	4030ZE10	4045ZE15
ZA3	41P5ZA10	42P2ZA15	43P7ZA20	45P5ZA30	ZE3	4045ZE10	4060ZE15
ZA4	42P2ZA10	43P7ZA15	45P5ZA20	47P5ZA30	ZE4	4060ZE12	4075ZE15
ZB1	42P2ZB10	43P7ZB15	45P5ZB20	47P5ZB30	ZF1	4055ZF10	4075ZF15
ZB2	43P7ZB10	45P5ZB15	47P5ZB20	4011ZB30	ZF2	4065ZF10	4090ZF15
ZB3	45P5ZB10	47P5ZB15	4011ZB20	4015ZB30	ZF3	4075ZF10	4110ZF15
ZB4	—	49P5ZB15	4013ZB20	—	ZF4	4090ZF10	4132ZF15
ZC1	—	49P5ZC15	4013ZC20	4018ZC30			
ZC2	47P5ZC10	4011ZC15	4015ZC20	4022ZC30			
ZC3	4011ZC10	4015ZC15	4018ZC20	4030ZC30			
ZC4	4013ZC10	4018ZC15	4022ZC20	4037ZC30			
ZD1	4013ZD10	4018ZD15	4026ZD20	4037ZD30			
ZD2	4015ZD10	4022ZD15	4030ZD20	4045ZD30			
ZD3	4018ZD10	4026ZD15	4037ZD20	4055ZD30			
ZD4	4022ZD10	4030ZD15	4045ZD20	4075ZD30			

6、Motor connecting wire

6.1 Motor connecting wire notes.

6.1.1 Recommend the use of 4 core shield cable.

6.1.2 Encoder connecting wire shall use our company special cable.

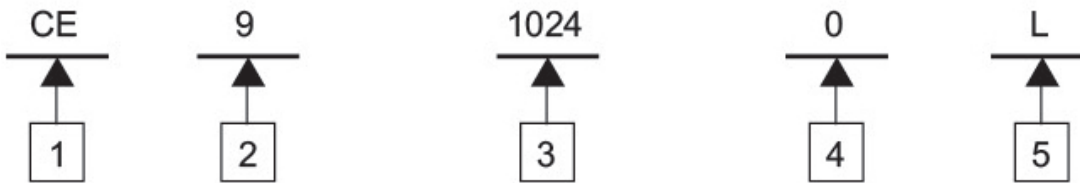
6.1.3 Encoder cable shall be correspondingly connected with motor U、V、W connection wire.

6.1.4 Ensure encoder cable wire No. shall be correspondingly connected with mainboard terminal(socket).

6.1.5 Fan connection wire shall accord with wind direction indicator, see the label of fan connection wire box.

6.2

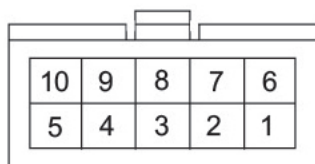
Encoder model instruction (CE-1024-0L for example)



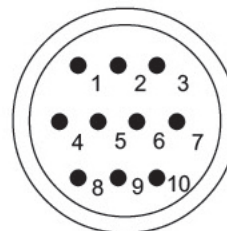
Code	Name	Description	Model meaning
1	Encoder code	CE: encoder	Encoder
2	Installation code	Code installation form 9 ϕ 9 cone axis installation 15 ϕ 15 cone axis installation 24 ϕ 24 axis installation 30 ϕ 30 axis installation	ϕ 9 cone axis installation
3	Encoder line	Code encoder line 1024 1024 line 2500 2500 line 6000 6000 line(According to the model selection) 8192 8192 line(According to the model selection)	1024 line
4	Encoder wire length	Code encoder wire length 0 0.3 meter	wire length 0.3meter
5	Connector Type	L:DC5V line drive output method	DC5V line drive output method

6.3 The encoder socket pins figure

Plastic socket pins position figure



Aerial socket pins figure



6.4 Plastic socket signal、cable color definition

Pin	5	10	4	9	3	8	2	7	6	1
Signal	PV1	G	A+	A-	B+	B-	Z+	Z-	T1	E
Cable color	Red	Black	White	Grey	Green	Blue	Yellow	Orange	Purple	shield

6.5 Aerial socket signal、cable color definition

Pin	10	8	4	2	9	7	3	1	5	6
Signal	PV1	G	A+	A-	B+	B-	Z+	Z-	T1	E
Cable color	Red	Black	White	Grey	Green	Blue	Yellow	Orange	Purple	shield

6.6 Electromagnetic brake applying instruction

6.6.1 The Electromagnetic brake for this motor is power-off brake. Must get power and open brake before motor running, power-off brake after motor stop running.

It is strictly prohibited to brake in rotating condition.

6.6.2 Friction plate of electromagnetic brake is wear-out part, which shall be tested or replaced after motor with brake has been running 3000 hours, lest bad brake performance occurs.

6.6.3 The rated voltage of electromagnetic brake is DC23V, voltage fluctuation not more than +5%and -5% of rated voltage.

6.6.4 Brake connecting terminal in connecting wire box, wire No. are D1 and D2.

6.7 Thermal protection switch description

Thermal protection switch wire (T1) of CTB-Z series servo motor has been connected to adapter plate(Except for motor with PENC2 adapter plate, thermal wire of this motor has separate connecting wire terminal, which in connecting wire box, lead line No.T1 and T2)or in aerial socket. More details see the position in 6.4 and 6.5

Thermal protection of CTB-Z series servo motor is normally-closed switch, when the motor inner temperature is lower than 125 °C , thermal protection switch is normally-closed; the inner temperature is higher than 125°C , thermal protection switch is normally-open.