LDB4 SERIES

ELECTRICAL TURRETS

INSTRUCTIONS FOR USE AND MAINTENANCE

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LDB4 SERIES ELECTRICAL TURRETS

1. SUMMARIZED

LDB4 series electrical turret is a new production developed in our factory Its specific character is three-terminal tooth location mechanism which is composed of pin-pan , inside and outside fluted disc. In the case of when the indexing of the turret ,the motor rotation in CW then the upper body without uplifted ,Thus it is eliminate invade for the cooling liquid and iron chippings and shavings when the turret is rotated . The terminal tooth location mechanism is the advanced mechanism which is popular in foreign countries and it is have been applied to the horizontal and vertical turret of our factory.

2. WORKING PRINCIPLE

When the turret receive the indexing signal from CNC system ,Relay which is control unit activated and motor rotates in clockwise . As soon as the motor drive the worm gear and worm shaft bring the upper fluted disc rotates in CW at this time the clutch pin into the clutch slot in the case of the clutch disk with the clutch pin drive the pin disc and then driving the upper body of the turret in CW rotation until the CNC received the position signaling from the Hall unit of the turret at this time the CNC system must be stop the motor and ordered the motor restart in opposite direction in order to in CCW rotation after 1s – 1.2s stop the motor . At this time the precision setting is completed the turret is locked at this the machine can be started .In order to go on working.

3. TURRET INDEXING SEQUENCE

Indexing -motor rotating in CW—position signal-the motor restart in opposite direction(CCW)-– precision setting and turret is clamping-stop motor .In order to go on working.

4. TECHNICAL DATA

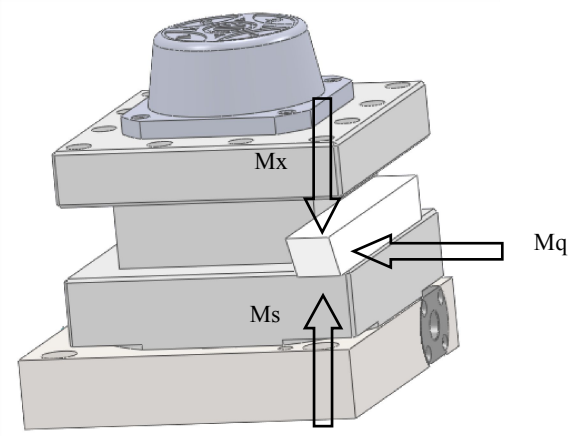
model	tools	Motor Power (W)	Motor Speed (rps)	Clamp (T)	upper body	lower body	Weight （Kg）
LDB4-51B0625）	4	90	1400	0.5	134×134	134×138	16
LDB4-57B6125）	4	90	1400	0.5	136×136	136×148	18
LDB4-65（6132）	4	120	1400	1	166×166	166×180	26
LDB4-70（6132）	4	120	1400	1	166×166	166×180	27
LDB4-70A（6132）	4	120	1400	1	152×152	161×171	25
LDB4-70B（6132）	4	120	1400	1	160×160	161×171	26
LDB4-72A（6140）	4	120	1400	1.2	192×192	192×192	38
LDB4-81（6140）	4	120	1400	1.2	166×166	192×192	35
LDB4-81A（6140）	4	120	1400	1.2	192×192	192×192	40
LDB4-110A（6150）	4	120	1400	1.2	192×192	192×192	46
LDB4-115（6150）	4	120	1400	1.2	166×166	192×192	40

LDB4-125（6150）	4	120	1400	1.2	166×166	192×192	45
LDB4-125A（6140）	4	120	1400	1.2	192×192	192×192	50
LDB4-110（6163）	4	180	1400	1.8	200×200	200×200	57
LDB4-120（6163）	4	180	1400	1.8	200×200	200×200	60
LDB4-120A（6163）	4	250	1400	2	240×240	240×240	80
LDB4-120/280	4	250	1400	2.2	280×280	280×280	100
LDB4-157（6172）	4	370	900	2.7	300×300	300×300	170
LDB4-173/350	4	370	900	3	350×350	350×350	200
LDB6-106(6140)	6	120	1400	1.2	166	192×192	45
LDB6-147(6163)	6	250	1400	2	220	200×240	80

5. PERFORMANCE DATA

Model	Repeatability accuracy	Reliability Times (times)	Maximum allowable torque (Nm)			Indexing time (s)		
			Mq	Mx	Ms	90°	180°	270°
LDB4-51B0625）	≤0.005mm	＞100000	300	700	250	1.9	2.4	3
LDB4-57B6125）	≤0.005mm	＞100000	400	900	300	1.9	2.4	3
LDB4-65（6132）	≤0.005mm	＞100000	500	1100	350	2.4	3	3.6
LDB4-70（6132）	≤0.005mm	＞100000	500	1100	350	2.6	3.2	3.9
LDB4-70A（6132）	≤0.005mm	＞100000	500	1100	350	2.4	3	3.6
LDB4-70B（6132）	≤0.005mm	＞100000	500	1100	350	2.4	3	3.6
LDB4-72A（6140）	≤0.005mm	＞100000	550	1250	400	2.6	3.2	3.9
LDB4-81（6140）	≤0.005mm	＞100000	600	1400	450	2.6	3.2	3.9
LDB4-81A（6140）	≤0.005mm	＞100000	600	1400	450	2.6	3.2	3.9
LDB4-110A（6150）	≤0.005mm	＞100000	600	1400	450	2.6	3.2	3.9
LDB4-115（6150）	≤0.005mm	＞100000	600	1400	450	2.6	3.2	3.9
LDB4-125（6150）	≤0.005mm	＞100000	600	1400	450	2.6	3.2	3.9
LDB4-125A（6150）	≤0.005mm	＞100000	600	1400	450	2.6	3.2	3.9
LDB4-110（6163）	≤0.005mm	＞100000	700	1800	600	2.7	3.4	4.1
LDB4-120（6163）	≤0.005mm	＞100000	700	1800	600	2.7	3.4	4.1
LDB4-120A（6163）	≤0.005mm	＞100000	1100	3000	900	3	3.8	4.6

LDB4-120/280	≤0.005mm	＞100000	1300	3800	1100	3	3.8		4.6	
LDB4-157（6172）	≤0.005mm	＞100000	1800	4500	1400	4	5.3		6.6	
LDB4-173/350	≤0.005mm	＞100000	3000	6000	2000	4	5.3		6.6	
						60°	120°	180°	240°	300°
LDB6-106（6140）	≤0.005mm	＞100000	600	1400	450	2.4	2.8	3.2	3.6	4
LDB6-147（6163）	≤0.005mm	＞100000	700	1800	600	2.5	3	3.5	4	4.5



6. **TURRET PLACING ON THE MACHINE**

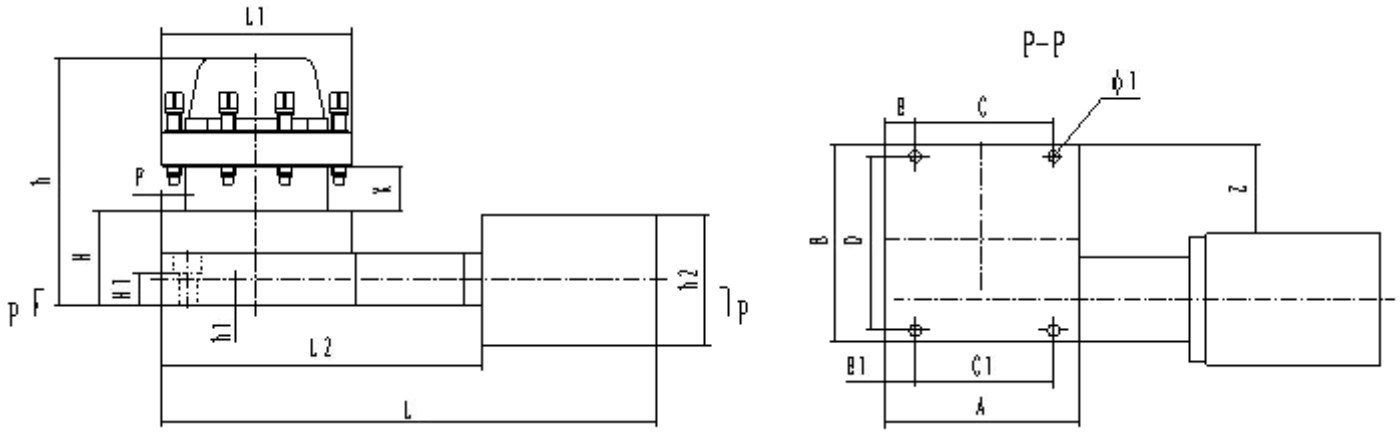
Put the turret on carriage of the lathe and remove the cover of the motor , rotating the worm shaft in clockwise by inner hexagon spanner then drilling the install hole when the upper body rotate about 45° and cleared the mounting surface fitting screw and then fixed the turret and then installation is completed .

7. **ADJUSTMENT**

7.1 Before using the turret must be test running , the turret without abnormal sound and over locating or over shoot.

7.2 At the first starting if there are some abnormal phenomenon for example turret can not running or stop , At this must be cut of the power at once solved the problem efer to catalogue 11 about trouble and it’ s eliminating method.

8. **INSTALLATION DATA**



Turrets type	dimension																		
	H	H1	A	B	C	C1	D	E	E1	L	L1	L2	h	h1	h2	F	φ1	Z	K
LDB4-51B(0625)	51	26	134	138	100	90	120	15	20	366	134	221	152	17.5	90	15	9	55	29
LDB4-57B(6125)	57	24	136	148	108	108	126	14	14	368	136	223	163	17.5	90	20	11	56	30
LDB4-65（6132）	65	22	166	180	130	130	156	18	18	354	166	214	185	17.5	90	20	13	63	40
LDB4-70（6132）	70	26	166	180	130	130	156	18	18	365	166	225	192	20	90	20	13	70	40
LDB4-70A（6132）	70	22	161	171	126	126	146	12	12	349	152	209	185	17.5	90	25	13	55	40
LDB4-70B（6132）	70	22	161	171	126	126	146	12.5	12.5	364	160	224	185	17.5	90	24	13	55	40
LDB4-72A（6140）	72	26	192	192	152	152	168	20	20	391	192	251	194	20	90	25	13	84	40
LDB4-81（6140）	81	26	192	192	152	152	168	20	20	391	166	251	203	20	90	25	13	84	40
LDB4-81A（6140）	81	26	192	192	152	152	168	20	20	391	192	251	203	20	90	25	13	84	40
LDB4-110A（6150）	110	41	192	192	152	152	168	20	20	391	192	251	232	26.5	90	25	13	84	41
LDB4-115（6150）	115	41	192	192	152	152	168	20	20	391	166	251	237	26.5	90	25	13	84	41
LDB4-125（6150）	125	51	192	192	152	152	168	20	20	391	166	251	247	36.5	90	25	13	84	41
LDB4-125A（6150）	125	51	192	192	152	152	168	20	20	391	192	251	247	36.5	90	25	13	84	41
LDB4-110（6163）	110	40	200	200	150	130	177	25	35	444	200	297	250	30	98	25	13	89	40
LDB4-120（6163）	120	40	200	200	150	130	177	25	35	444	200	297	260	30	98	32	13	89	50
LDB4-120A（6163）	120	40	240	240	210	210	210	15	15	492	240	332	260	30	110	42	13	106	50
LDB4-120/280	120	40	280	280	240	240	240	20	20	532	280	372	260	30	110	40	13	134	54
LDB4-157（6172）	157	68	300	300	260	260	260	20	20	584	300	412	330	60	110	40	17.5	163	70
B4-173/350	173	71	350	350	270	270	310	40	40	625	350	450	356	60	110	50	20	210	75
LDB6-106（6140）	106	26	192	192	152	152	168	20	20	391	166	251	203	17.5	90	25	13	82	
LDB6-147（6163）	147	40	200	240	170	170	210	15	15	444	210	297	261	30	98	32	13	110	

9. DISASSEMLE

9.1 Disassemble sequence

9.1.1 Remove the upper cover 1 remove the signaling disc 2 and magnetic base 4.

9.1.2 Put out the two M4 screw from nut 5 and ring and flat bearing and clutch 7.

9.1.3 Remove the upper body 11.Removed the terminal tooth 16 and screw arbor 19 nut 18 clutch pin 8 against pin 10 (attention position of the terminal tooth 16 and nut 18 and upper body11)

9.1.4 Remove the motor and base 12 and end cover 22.

9.1.5 From cover 22 put out the worm shaft 23 and bearing .

9.1.6 Remove the shaft 14.put out the worm 15 and flat bearing , remove the against disc 17.

9.2 INSTALLING SEQUENCE

9.2.1 When the turret is installing at first all the assemblies must be coating oil and the driving system must be lubrication.

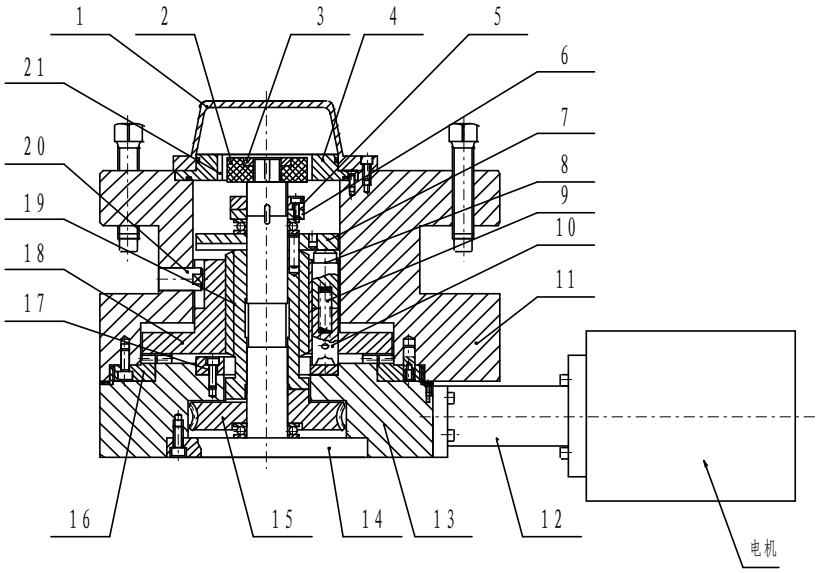
9.2.2 When the turret installing in opposed sequence of the disassembling.

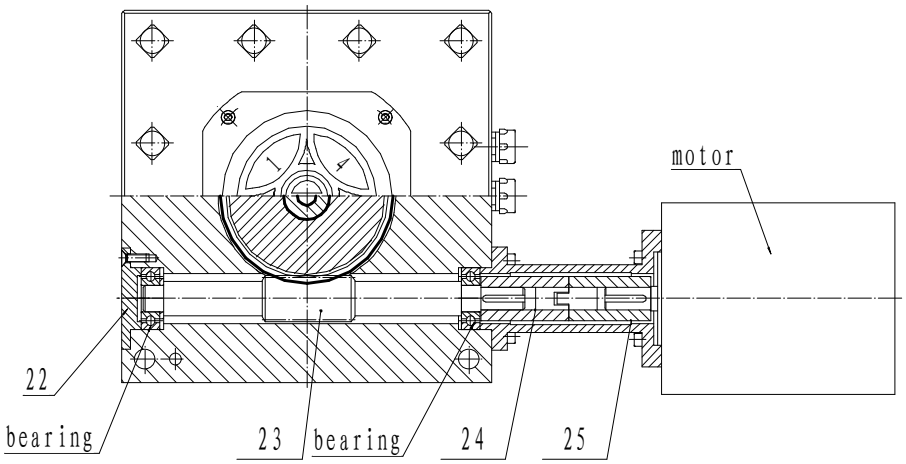
9.2.3 When the turret mesh each other the four plates of the lower body 13 and upper body 11 must be paralleled. The against pin 10 must be in slot of the against disc 17 , the clutch pin 8 must be on the plate of the clutch disc 7 and about 125 ° of the 17.

9.2.4 Rotating the worm shaft by the inner hexagon spanner and clamping the nut 5 and then loosened screw hole of the ring 6 and installing 2—M5 screw then turn the worm shaft until clamping it .

9.2.5 Adjust position of the magnetic 21 and Hall unit make sure that the position of the 21 and Hall unit is advanced.

1.cover
2.signalling disc
3.screw
4.base of the magnetic
5.nut
6.ring
7.clutch disc
8.clutch pin
9.spring
10.aganst pin
11.upper body of the turret
12.connection base
13.lower body of the turret
14.centre shaft
15.worm gear
16.terminal tooth
17.aginst disc
18.nut
19.screw arbor
20.pin
21.megnetic
22. end cover
23.worm shaft
24.connector
25.connector





10. THE ELECTRIC CONTROL OF THE TURRET

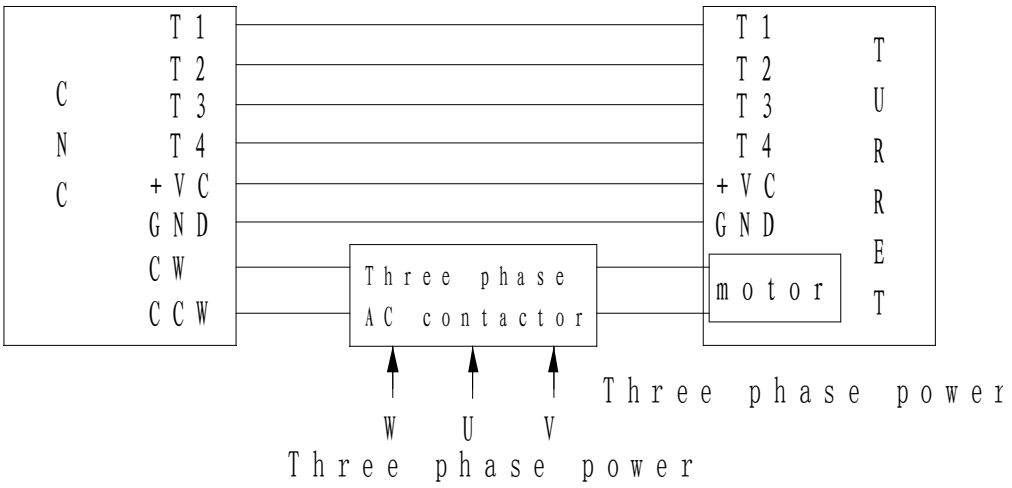
The control system of the turret composed of high voltage control unite and lower voltage unit .

10.1 High voltage unit is composed of three phase supply and AC asynchronous motor and it is can be control turret being indexing and clamping .

10.2 lower voltage control unit

It is composed of position sensor and signaling disc and according to the different model there are two method one is the 15T control unit other is 5-3T.

10.2.1 15T diagram



10.2.2 WIRING DIAGRAM

Turret signal pin（15 core hole-type pin）

pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
function	T1	T2	T3	T4	T5	T6			earth	power					
color	yellow	orange	blue	white	pink	purple			green	red					

Turret's motor pin（4 core needle-type pin）

pin	1	2	3	4
function	PE	U	V	W
color	olivine	black	black	black

11. Fault, Finding List, Correction

Fault	Finding List	Correction
1. Motor can't start or upper body can't rotation	1. Phase inversion votage is too low.	Cut off the power at once ,adjust the phase and voltage of the motor then start again.
2. Upper body rotatting continually and can't stop	1. Signalling disc bad contact. 2. Signalling disc fault. 3. Hall unit is broken or short. 4. Pole of magnet steel is inversion. 5. The position of the magnet steel and Hall unit is relative departure. 6. The Hall unit or magnet is bad.	1. Unload cover,checking signalling disc and supply. 2. Adjust the position of the magnet and Hall unit,or replace Hall unit.
3. After having correctlly perfomed the indexing cycle the disk stil unloked.	1. The time of the CCW so short. 2.bad contact. 3. With the locking signal cut off the CCW rotating signal.	1. Adjusting the time of CCW. 2. Checking wire of the turret. 3. Can't with the locking signal for the motor in CCW.
4. The disc goes on rotating without stopping or over.	The position of the magnet and hall unit no good,delay between the CW and CCW is so long.	Adjust the position of the magnet and hall unit and delay time between the CW and the CCW.
5. The face of the workpice presant some ripple.	1. The turret is not clamping. 2. Fault of the mechanical system.	Adjusted clamping time (must be according to the instruction of the turret.

Note: when adjusting the relative position of the Hall unit and magnet the Carrier must be locked and the position of Hall unit must be 1/3 ahead magnet steel.