

## Quality control standard of high high speed reducer

### 1. Body / box body

(1) The section of the cover and the body shall be smooth and smooth to ensure tight assembly. Check the contact tightness of the section, that is, the insertion depth of the plug ruler less than 0.05mm shall not be greater than 1 / 3 of the section.

(2) The upper cover and the body shall not crack, and the kerosene inspection shall not contain leakage.

### 2. Dute line cylindrical gear

(1) The gear shall not have defects in burrs, cracks, fractures, etc.

The working surface of the (2) gear engagement that the tooth height and tooth width is not greater than 20%.

The (3) gear must be correctly engaged after assembly and its contact area shall meet the provisions in Table 1.

Table 1

Name name, said		Fine, degree, etc., grade		
gear [rack		7	8	9
touch	High tooth teeth not less than (%)	45	40	30
area	Ttooth width not less than (%)	60	50	40

(4) The side clearance of gear engagement shall meet specified in Table 2.

Table 2, Unit: mm

name	centre-to-centre spacing							
	~ 50	> 50 ~ 80	> 80 ~ 120	> 120 ~ 200	> 200 ~ 320	> 320 ~ 500	> 500 ~ 800	> 800 ~ 1250
Side gap	0.085	0.105	0.13	0.17	0.21	0.26	0.34	0.42

(5) The top gap of the gear engagement is 0.2~0.3m (m is the normal modulus).

(6) Check the side and top clearance of the gear by pressure lead method and if not in accordance with Articles (4) and (5), the center distance may be corrected in Table 2 and (5)

(7) The center distance limit deviation of both gears shall meet the provisions in Table 3.

Table 3: Unit: mm

name	centre-to-centre spacing			
	~ 50	> 50 ~ 80	> 80 ~ 120	> 120 ~ 200
Extreme deviation	±0.060	±0.080	±0.090	±0.105
name	> 200 ~ 320	> 320 ~ 500	> 500 ~ 800	> 800 ~ 1250
Extreme deviation	±0.120	±0.160	±0.180	±0.200

(8) The parallelism of the gear centerline on the tooth width is not greater than that specified in Table 4

Table 4: Unit: mm

accuracy class	normal modulus	Dooth, wheel, width, degrees						
		~ 55	> 55 ~ 110	> 110 ~ 160	> 160 ~ 220	> 220 ~ 320	> 320 ~ 450	> 450 ~ 630
7	1 ~ 30	0.017	0.019	0.021	0.024	0.028	0.034	0.04
8	1 ~ 30	0.021	0.024	0.026	0.03	0.036	0.042	0.05
9	2.5 ~ 50	0.026	0.03	0.034	0.038	0.045	0.052	0.06

(9) The radial beat of the gear rim shall not be greater than that specified in Table 5

Table 5: Unit: mm

accuracy class	normal modulus	Gear diameter							
		> 50	> 50 ~ 80	> 80 ~ 120	> 120 ~ 200	> 200 ~ 320	> 320 ~ 500	> 500 ~ 800	> 800 ~ 1250
7	1 ~ 30	0.032	0.042	0.05	0.058	0.07	0.08	0.105	0.115
8	1 ~ 30	0.05	0.065	0.08	0.105	0.11	0.12	0.15	0.19
9	> 2.5 ~ 50	0.08	0.105	0.12	0.15	0.18	0.2	0.24	0.3

(10) The maximum allowable wear value of tooth thickness at the gear section circle shall meet Table 6.

Table 6, Unit: mm

Cycle line speed	≤ 2 MS	> 2 MS	> 6 MS
Maximum allowable wear value	0.24m	0.16m	0.10m

### 3. bevel gear wheel

(1) The gear must be smooth without burrs, scars, cracks, etc.

(2) The limit deviation of the clip angle of the gear shaft is specified in Table 7.

Table 7: Unit: mm

name	Skle cone bus length						
	≤50	> 50 ~ 80	> 80 ~ 120	> 120 ~ 200	> 200 ~ 320	> 320 ~ 500	> 500 ~ 800
Axis clip angle limit deviation	±0.045	±0.058	±0.070	±0.080	±0.095	±0.110	±0.130

(3) The displacement of gear centerline shall not be greater than specified in Table 8 and the displacement inspection method is shown in FIG. 4.

Table 8, Unit: mm

accuracy class	transverse module	Skle cone bus length			
		≤200	> 200 ~ 320	> 320 ~ 500	> 500 ~ 800
7	1 ~ 16	0.019	0.022	0.028	0.036
8	1 ~ 16	0.024	0.028	0.036	0.045
9	2.5 ~ 16	0.03	0.036	0.045	0.055

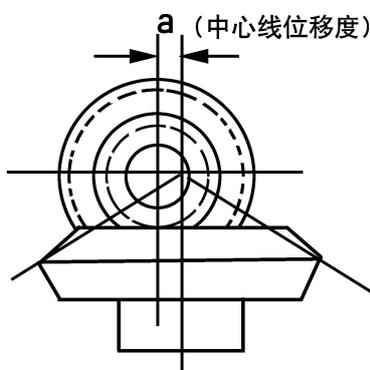


Figure 1. Inspection method of center line displacement of cone gear

(4) The side gap of gear engagement shall meet the provisions in Table 9

Table 9: Unit: mm

name	Skle cone bus length						
	≤50	> 50 ~ 80	> 80 ~ 120	> 120 ~ 200	> 200 ~ 320	> 320 ~ 500	> 500 ~ 800
Side gap	0.085	0.1	0.13	0.17	0.21	0.26	0.34

(5) Top gap of gear engagement is 0.2~0.3m.(The m is the large-end module number)

(6) The displacement of the gear cone shall not be greater than that specified in Table 10.

Table 10 Units: mm

accuracy class	transverse module				
	1 ~ 2.5	> 2.5 ~ 6	> 6 ~ 10	> 10 ~ 16	> 16 ~ 30
7	0.03	0.045	0.06	0.075	- - -
8	0.038	0.058	0.08	0.095	0.12
9	- - -	0.075	0.1	0.115	0.16

(7) Check the engagement area of the gear by coloring method, and the correctly engaged contact spots shall be covered in the middle of the side of the large gear teeth

Part, and close to the small end, shall have a contact area as specified in Table 11.

Table 11

Name name, said		accuracy class		
		7	8	9
contact area	High tooth teeth not less than (%)	60	50	40
	Ttooth width not less than (%)	60	50	40

(8) The gear can be adjusted on the large gear, and the correction limit area shall meet the provisions in Table 12.

Table 12. Unit: mm

name	accuracy class	
	7 ~ 8	9
Tth area (%)	< 40	- - - -
Modify the method	Mill or scrape after grinding	Scratch or file after scraping

(9) The radial beating of the top cone of the cone gear shall not be greater than that specified in Table 13.

Table 13: Unit: mm

Male, said, foot, inch		(Movement) Precision level		
		7	8	9
Large-end partition circle diameter	≥ 40 ~ 100	0.025	0.05	0.08
	> 100 ~ 200	0.03	0.06	0.1
	> 200 ~ 400	0.04	0.08	0.12

	> 400 ~ 800	0.05	0.1	0.15
	> 800 ~ 2000	0.07	0.12	0.2

**4. Cochlear wheel, worm**

(1) The tooth surface of the worm wheel and worm shall not have defects in cracks, burrs, serious scratches and so on.

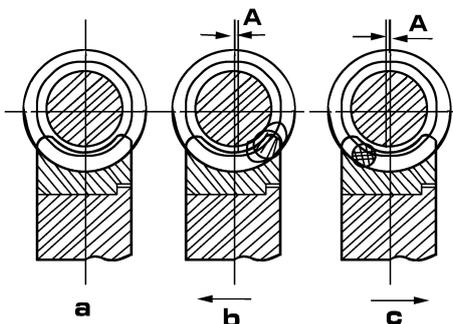
(2) The side clearance of the worm wheel and worm shall meet the provisions in Table 14.

Table 14. Unit: mm

Axial neck diameter	50 ~ 80	> 80 ~ 120	> 120 ~ 180	> 180 ~ 260
Axis gap	0.100 ~ 0.180	0.120 ~ 0.210	0.140 ~ 0.245	0.165 ~ 0.285

(3) The top clearance of the worm worm shall be 0.2~0.3m (m is moduli).

(4) 4 The engagement contact spots of the worm wheel and worm account for 35~50,% of the working surface of the worm wheel. The correct contact position should be close to the exit of the worm, and shall not be offset left and right (see Figure 2 for details).

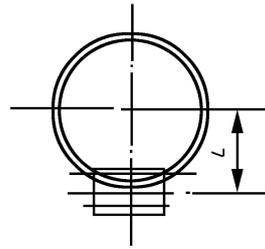


graph 2

(5) The deviation of the center distance of worm wheel and worm is shown in Figure 3, and the limit deviation shall meet the provisions in Table 15.

Table 15. Unit: mm

accuracy class	centre-to-centre spacing				
	> 40 ~ 80	> 80 ~ 160	> 160 ~ 320	> 320 ~ 630	> 630 ~ 1250
7	±0.042	±0.055	±0.070	±0.085	±0.110
8	±0.065	±0.090	±0.110	±0.130	±0.180
9	±0.105	±0.140	±0.180	±0.210	±0.280

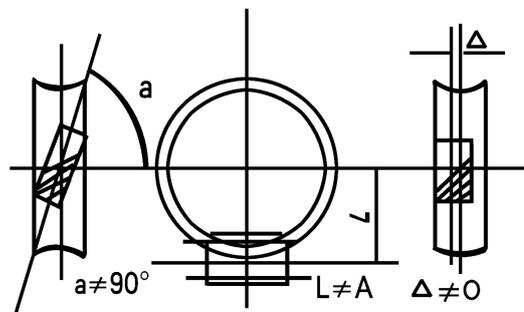


graph 3

$$L \neq A$$

(A is the center distance)

(6) The perpendicularity of the worm wheel and worm centerline is shown in Figure 4, and the unperpendicularity of the centerline on the tooth width shall not be greater than that specified in Table 16.



graph 4

(7) The offset of the middle plane of the worm wheel and the worm center line is shown in Figure 7, and the limit deviation amount shall conform to Table 16.

Table 16, Unit: mm

accuracy class	centre-to-centre spacing				
	> 40 ~ 80	> 80 ~ 160	> 160 ~ 320	> 320 ~ 630	> 630 ~ 1250
7	±0.034	±0.042	±0.052	±0.065	±0.080
8	±0.052	±0.065	±0.085	±0.105	±0.120
9	±0.085	±0.106	±0.130	±0.170	±0.200

(8) The maximum allowable value of tooth thickness wear at the worm section shall meet the provisions in Table 6.

(9) The radial beating of the worm wheel and tooth ring shall not be greater than that specified in Table 17.

Table 17: Unit: mm

accuracy class	Round diameter of the worm wheel separation degree							
	≤50	> 50 ~ 80	> 80 ~ 120	> 120 ~ 200	> 200 ~ 320	> 320 ~ 500	> 500 ~ 800	> 800 ~ 1250
7	0.032	0.042	0.05	0.058	0.07	0.08	0.105	0.115
8	0.05	0.065	0.08	0.105	0.11	0.12	0.15	0.19
9	0.08	0.105	0.12	0.15	0.18	0.2	0.24	0.3

**5. Axis**

- (1) The shaft and shaft diameter shall not have burrs, scratches, scratches and other defects.
- (2) The cylinder degree of the axial diameter shall not be greater than 0.02mm.
- (3) The linlntness at the axial diameter shall not be greater than 0.015mm.The straightness of other parts shall not be greater than 0.04mm / m.
- (4) The shaft neck roughness at the mounting bearing is not greater than 0.8.
- (5) After the wear of the key groove on the shaft, the key groove can be milling at the original key groove 120 °, and the asymmetry between the key groove and the shaft is not more than 0.03mm.
- (6) The face of the shaft and the seal parts fit with serious wear or the shaft cracks shall be replaced.

**6 antifriction bearing**

Special tools shall be used for (1) disassembly and rolling bearings, and direct knock is strictly prohibited.

- (2) Check the rolling bearing if any of the following conditions shall be replaced.

A The inner a nd outer ring of bearing roller, rolling body and holder.

The b bearing rotation has noise, or the roller is too loose.

- (3) After the bearing is loaded into the shaft neck, the inner ring end surface must be close to the shaft shoulder or positioning ring, and checked with a 0.05mm plug ruler, and shall not be passed.

(4) The cooperation of bearing inner ring and shaft, and the cooperation of outer ring and bearing seat are selected according to Table 18.      Table 18

centripetal ball bearings and centripetal thrust bearings		The thrust roller bearing	
The inner seat fits with the shaft	The outer seat ring fits with the bearing seat	Inner seat fit with bearing	The outer seat ring fits with the bearing seat
k6, js6	J7,H7	m6,k6	J7,H7

- (5) The hole roughness combined with the rolling bearing outer ring is less than 1.6.

**7 sleeve bearing**

- (1) The shaft and bearing seat are H7 / m6 and the roughness is 1.6.
- (2) Shaft and shaft are H8 / f9 and roughness is 0.8.
- (3) The shaft clearance shall meet the provisions in Table 19.

Table 19: Unit: mm

Axial neck diameter	50 ~ 80	> 80 ~ 120	> 120 ~ 180	> 180 ~ 260
Axis gap	0.100 ~ 0.180	0.120 ~ 0.210	0.140 ~ 0.245	0.165 ~ 0.285

- (4) Check the contact area of the shaft tile by coloring method, not less than 2 points per square centimeter, and 60~90°C in the middle part of the lower tile  
Contact within range.
- (6) Bearing alloy shall not have defects in uncasing, crack, sand eye, damage, stomata and so on.

**8 gasket ring**

- (1) shall be replaced when the sealing ring finds aging deformation, wear and damage.  
Before fitting, check the tightness of the embedded spring in the sealing ring, apply appropriate grease, and pay attention to positive and reverse direction during installation.

**9 Acceptance and commissioning**

- 1) .Preparation before test
  - (1) shall check the plate number and liquid surface of lubricating oil and must meet with the requirements.  
The (2) should be used to operate for several weeks to confirm that the rotation is flexible and smooth before starting.
- 2) .Air-load test car
  - (1) shall not be oil seepage at each seal and junction.
  - (2) connections, fasteners shall be close and reliable without loosening.  
The (3) operates smoothly and has no vibration and impact sound.
  - (4) oil pump is normal.
  - (5) The convertible work reducer shall be tested out in the positive and reverse rotation directions respectively. The test time shall not be less than one hour, and the positive and reverse test time shall not be no less than one hour each.
- 3) .The maximum oil temperature shall not exceed 60°C, rolling bearing temperature exceeds 70°C and sliding bearing temperature exceeding 65°C.
- 4) .Load test time shall not be less than two hours.
- 5) .After the load test run, the lubricating oil should be replaced to remove the worn metal end.
- 6) .The gears engage well with no abnormal noise.
- 7) .Check the vibration condition, and the amplitude shall not be more than 0.08mm.