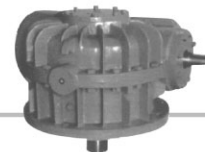


CW圓弧圓柱蜗杆减速机

CW CIRCULAR TOOTH AND CYLINDRICAL WORM REDUCER



CW型圆弧圆柱蜗杆减速机 CW Circular tooth and cylindrical worm reducer

一、概述 Overview

圆弧圆柱蜗杆减速机采用单级蜗杆减速传动，符合行业推荐性标准JB/T7935-95（原国标GB9147-88），此标准达到国际九十年代水平。全系列共包括三种型号，16种中心距，12种速比。输入功率范围在0.39~189KW之间，输出扭矩在107~13500N·m之间。

圆弧圆柱蜗杆轴可正、反两个方向运转，输入转速不超过1500r/min，工作环境温度 $-40\sim 40^{\circ}\text{C}$ 。当工作环境温度低于 0°C 时，起动前润滑油必须加热到 0°C 以上；当工作环境温度高于 40°C 时，必须采取冷却措施。

The circular tooth and cylindrical worm reducer adopts single-stage worm reduction transmission, conforming to the industrial recommendation standard JB/T7935-95 (previous GB9147-88), equivalent to the international level in the 1990s. The full series includes three types, 16 center distance values and 12 speed ratio values, with input power range 0.39~189KW and output torque range 107~13500N·m.

The circular tooth and cylindrical worm shaft is available for running in either forward or reverse direction, with input rotation speed not exceeding 1,500r/min and working ambient temperature $-40\sim 40^{\circ}\text{C}$. When working ambient temperature is below 0°C , lubricating oil must be heated above 0°C before starting; when working ambient temperature is higher than 40°C , cooling actions must be taken.

二、型号、中心距、传动比、标记示例、主要尺寸

Type, Center distance, Ratio, Example of sign, Main dimensions

1、型号、中心距

本系列减速机包括：

CWU—蜗杆在蜗轮之下的圆弧圆柱蜗杆减速机；

CWS—蜗杆在蜗轮之侧的圆弧圆柱蜗杆减速机；

CWO—蜗杆在蜗轮之上的圆弧圆柱蜗杆减速机；

三种型号及 $a=63\sim 500\text{m}$ ，16种中心距。

1. Type, center distance

This reducer series includes:

CWU – circular tooth and cylindrical worm reducer with worm below worm gear;

CWS – circular tooth and cylindrical worm reducer with worm beside worm gear;

CWO – circular tooth and cylindrical worm reducer with worm above worm gear;

Three types, $a=63\sim 500\text{m}$, and 16 center distance values.

本系列减速机型号和中心距见下表：

See the table below for types and center distance values of this reducer series:

单位 (Units) : mm

代号 Mode 型号 Type		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CWU	第一系列 Series 1	63	80	100	125	-	160	-	200	-	250	-	315	-	400	-	500
	第二系列 Series 2	-	-	-	-	(140)	-	(180)	-	(225)	-	280	-	355	-	450	-
CWS	第一系列 Series 1	63	80	100	125	-	160	-	200	-	250	-	315	-	400	-	500
	第二系列 Series 2	-	-	-	-	-	-	-	-	-	-	280	-	355	-	450	-
CWO	第一系列 Series 1	63	80	100	125	-	160	-	200	-	250	-	-	-	-	-	-
	第二系列 Series 2	-	-	-	-	(140)	-	(180)	-	(225)	-	-	-	-	-	-	-

注：优先选用第一系列，表中第二系列中加括号的中心距仅提出型式尺寸，图纸根据用户需要，另行设计。

Notes: Series 1 is preferred. Series 2 with center distance values in parentheses in the table only provides types and dimensions, and drawings will be designed separately as customized.

2、减速器的公称传动比*i*和传动比代号见下表：

See the table below for nominal transmission ratio i and transmission ratio code of reducer:

单位 (Units) : mm

传动比代号 Ratio mode	1	2	3	4	5	6	7	8	9	10	11	12
i	5	6.3	8	10	12.5	16	20	25	31.5	40	50	63

3、减速机标记示例 Reducer example of sign

CWU 200—10—II F

第二种装配型式带风扇（装配型式）

Assembly form II with fan (assembly form)

公称传动比 $i=10$ （用公称传动比表示）

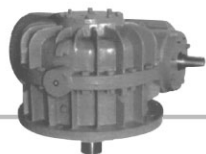
Nominal ratio (expressed in nominal transmission ratio)

中心距 $a=200$ （用实际数字表示）

Center distance $a=200$ (expressed in actual numerals)

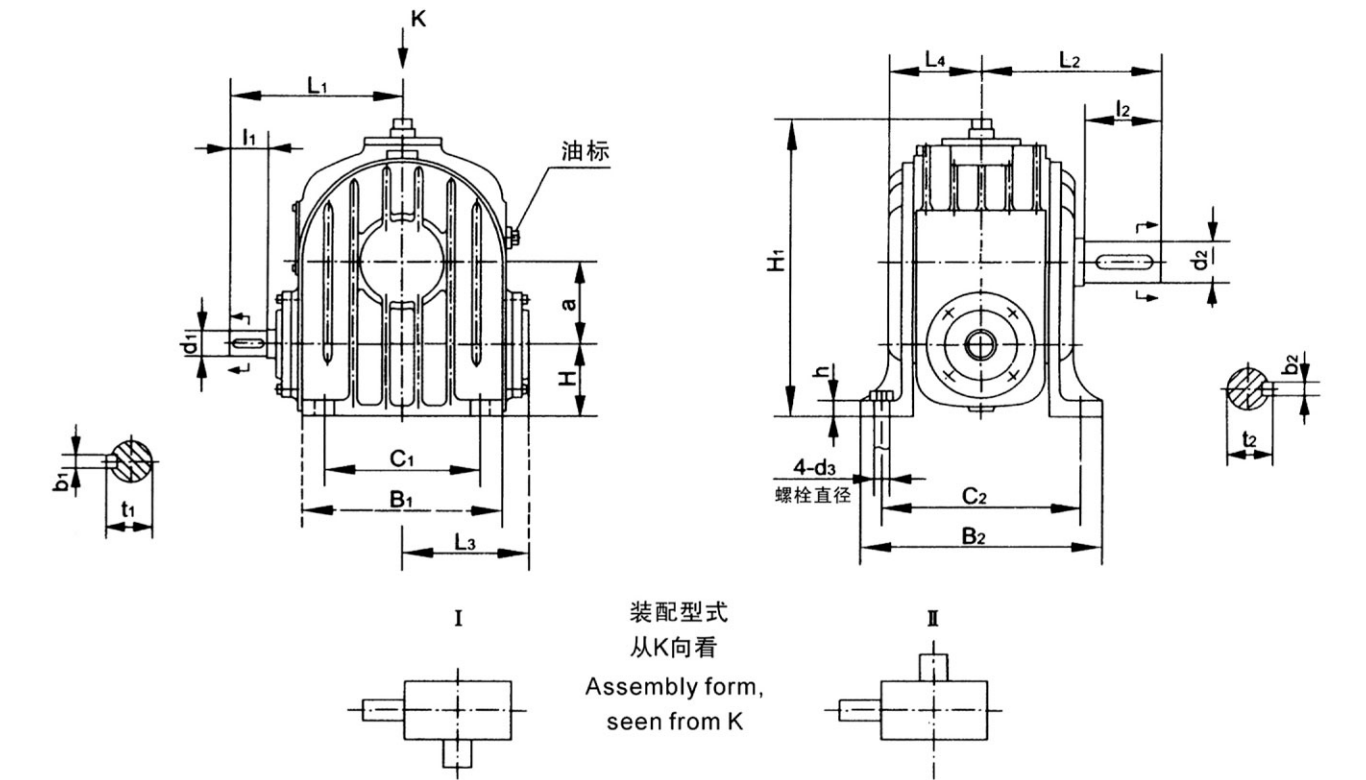
型号（蜗杆在下）

Worm below



三、规格及基本参数 Specifications and T basic parameters

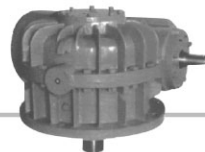
CWU63-CWU100型减速器外形和安装尺寸
Overall and mounting dimensions of CWU63-CWU100 reducer



单位 (Units) : mm

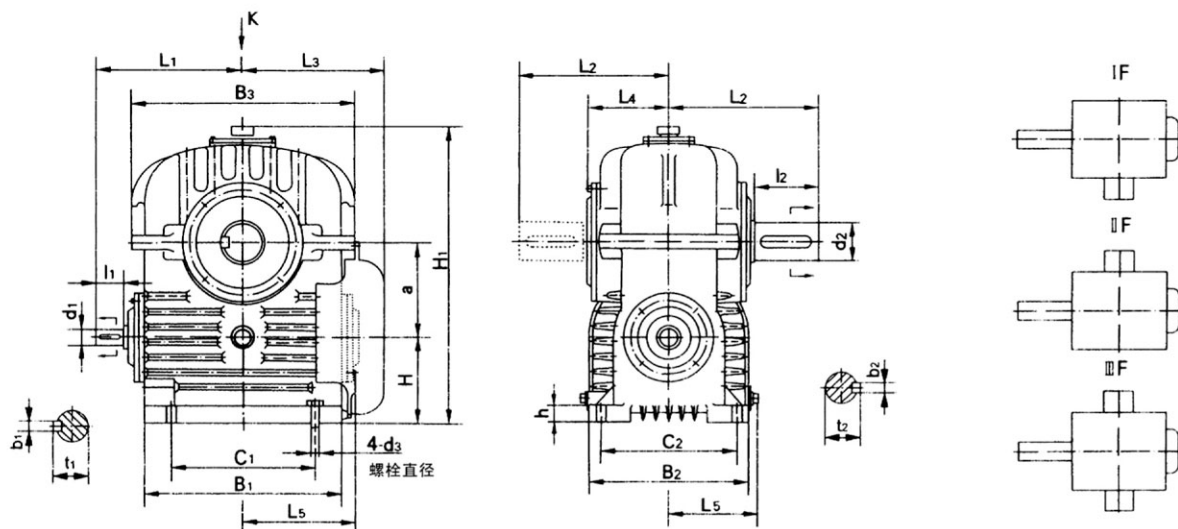
尺寸 Size 型号 Type	a	B ₁	B ₂	C ₁	C ₂	h	H	H ₁	d ₃	i ≤ 12.5				
										d ₁	l ₁	b ₁	t ₁	L ₁
CWU63	63	148	180	115	150	12	54	220	M12	19js6	28	6	21.5	128
CWU80	80	175	200	140	170	15	65	267	M12	24js6	36	8	27	151
CWU100	100	218	230	175	190	15	80	322	M12	28js6	42	8	31	182

尺寸 Size 型号 Type	i ≥ 16					d ₂	l ₂	b ₂	t ₂	L ₂	L ₃	L ₄	重量(kg) (不包括油重) weight (Excluding oil weight)
	d ₁	l ₁	b ₁	t ₁	L ₁								
CWU63	19js6	28	6	21.5	128	32k6	58	10	35	135	97	70	19.5
CWU80	24js6	36	8	27	151	38k6	58	10	41	143	110	81	28.5
CWU100	24js6	36	8	27	176	42k6	82	12	45	182	130	95	43



CWU125-CWU500型减速器外形和安装尺寸

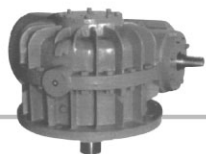
Overall and mounting dimensions of CWU125-CWU500 reducer



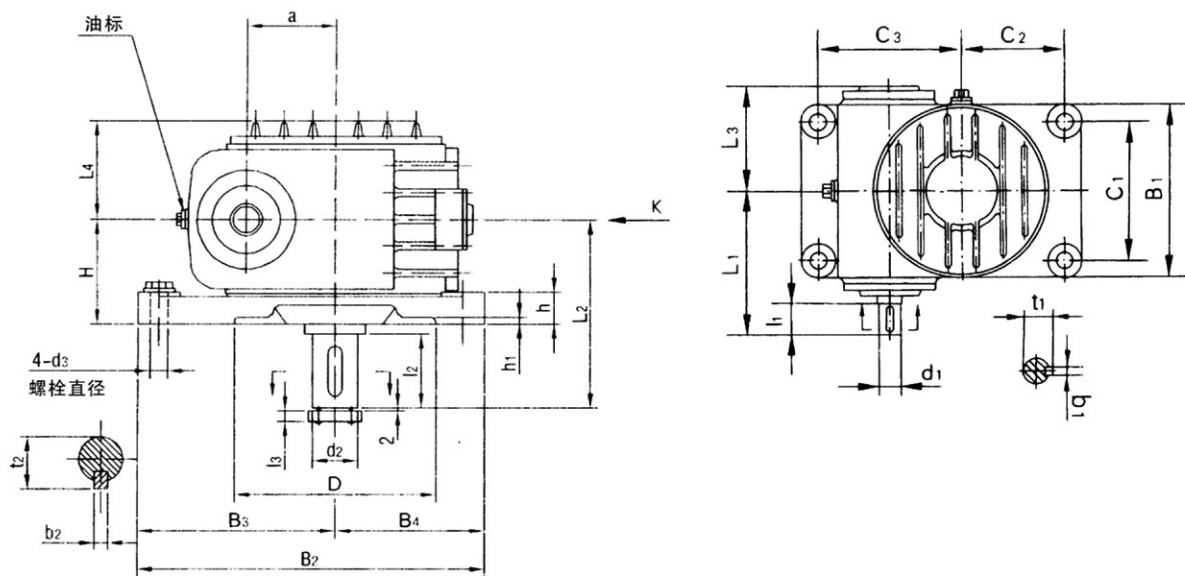
单位 (Units) : mm

型号 Type	尺寸 Size	a	B ₁	B ₂	B ₃	C ₁	C ₂	i≤12.5					i≥16				
								d ₁	l ₁	b ₁	t ₁	L ₁	d ₁	l ₁	b ₁	t ₁	L ₁
CWU125	125	260	250	310	220	205	32k6	58	10	35	218	28js6	42	8	31	202	
CWU140	140	285	275	345	230	225	38k6	58	10	41	228	28j6	42	8	31	212	
CWU160	160	325	300	385	230	250	42k6	82	12	45	277	32k6	58	10	35	253	
CWU180	180	350	320	420	260	270	42k6	82	12	45	292	32k6	58	10	35	268	
CWU200	200	400	350	465	280	300	48k6	82	14	51.5	324	38k6	58	10	41	300	
CWU225	225	440	380	505	325	325	48k6	82	14	51.5	342	38k6	58	10	41	318	
CWU250	250	510	410	575	370	350	55k6	82	16	59	380	42k6	82	12	45	380	
CWU280	280	570	460	645	420	400	60m6	105	18	64	430	48k6	82	14	51.5	407	
CWU315	315	640	530	715	470	445	65m6	105	18	69	470	48k6	82	14	51.5	447	
CWU355	355	730	580	805	540	490	70m6	105	20	74.5	515	55k6	82	16	59	492	
CWU400	400	790	620	880	620	530	75m6	105	20	79.5	545	60m6	105	18	64	545	
CWU450	450	885	680	985	700	580	80m6	130	22	85	625	65m6	105	18	69	600	
CWU500	500	1015	750	1110	760	640	90m6	130	25	95	680	70m6	105	20	74.5	655	

型号 Type	尺寸 Size	d ₂	l ₂	b ₂	t ₂	L ₂	L ₃	L ₄	L ₅	L ₆	h	H	H ₁	d ₃	重量(不包括油重)(kg) weight (Excluding oil weight)
CWU125	55k6	82	16	59	222	202	133	153	147	30	125	408	M16	92	
CWU140	60m6	105	18	64	260	220	144	166	160	30	140	445	M16	120	
CWU160	65m6	105	18	69	270	245	156	186	172	35	160	510	M16	145	
CWU180	75m6	105	20	79.5	290	260	173	200	182	35	180	560	M20	200	
CWU200	80m6	130	22	85	325	295	180	235	197	40	200	650	M20	260	
CWU225	90m6	130	25	95	340	320	193	247	212	40	225	730	M20	320	
CWU250	100m6	165	28	106	385	360	208	285	228	45	225	785	M24	395	
CWU280	110m6	165	28	116	405	390	225	312	253	50	250	885	M24	530	
CWU315	120m6	165	32	127	420	430	242	352	289	50	280	980	M30	700	
CWU355	130m6	200	32	137	470	480	255	397	315	55	300	1085	M30	910	
CWU400	150m6	200	36	158	490	515	277	429	335	60	315	1175	M30	1200	
CWU450	170m6	240	40	179	560	575	299	484	367	65	355	1310	M36	1660	
CWU500	190m6	280	45	200	640	655	343	549	403	80	400	1450	M36	2330	



CWS63-CWS100型减速器外形和安装尺寸 Overall and mounting dimensions of CWS63-CWS100 reducer



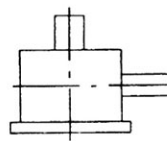
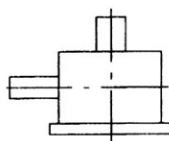
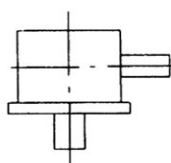
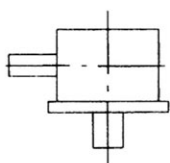
装配型式从K向看
Assembly form, seen from K

I

II

III

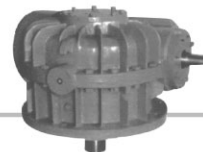
IV



单位 (Units) : mm

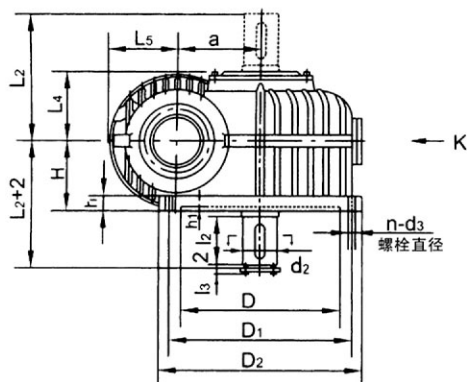
尺寸 Size 型号 Type	a	B_1	B_2	B_3	B_1	C_1	C_2	C_3	D	h	h_1	$i \leq 12.5$				
												d_1	l_1	b_1	t_1	L_1
CWS63	63	155	245	140	105	125	90	125	190	23	5	19js6	28	6	21.5	128
CWS80	80	180	270	160	110	150	95	145	210	23	5	24js6	36	8	27	151
CWS100	100	220	325	200	125	190	110	185	240	23	5	28js6	42	8	31	182

尺寸 Size 型号 Type	$i \geq 16$					d_2	l_2	b_2	t_2	L_2	L_3	L_4	H	d_3	重量(kg) (不包括油重) weight (Excluding oil weight)
	d_1	l_1	b_1	t_1	L_1										
CWS63	19js6	28	6	21.5	128	32k6	58	10	35	135	97	70	75	M12	19
CWS80	24js6	36	8	27	151	38k6	58	10	41	143	110	81	80	M12	28
CWS100	24js6	36	8	27	176	42k6	82	12	45	182	130	95	95	M12	42.5



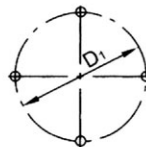
CWS125-CWS500型减速器外形和安装尺寸

Overall and mounting dimensions of CWS125-CWS500 reducer

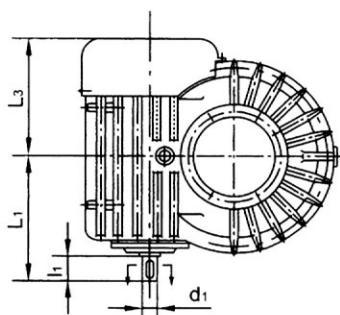
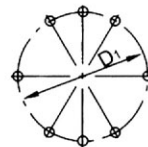


地脚螺孔位置如图
Foundation bolt hole position as shown in the drawing

a=100-450



a=500



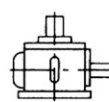
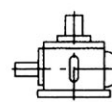
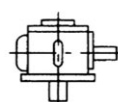
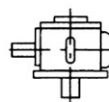
装配型式 (F-带风扇) 从K向看
Assembly form (F-with fan), seen from K

IF

II F

III F

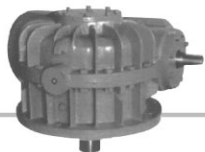
IV F



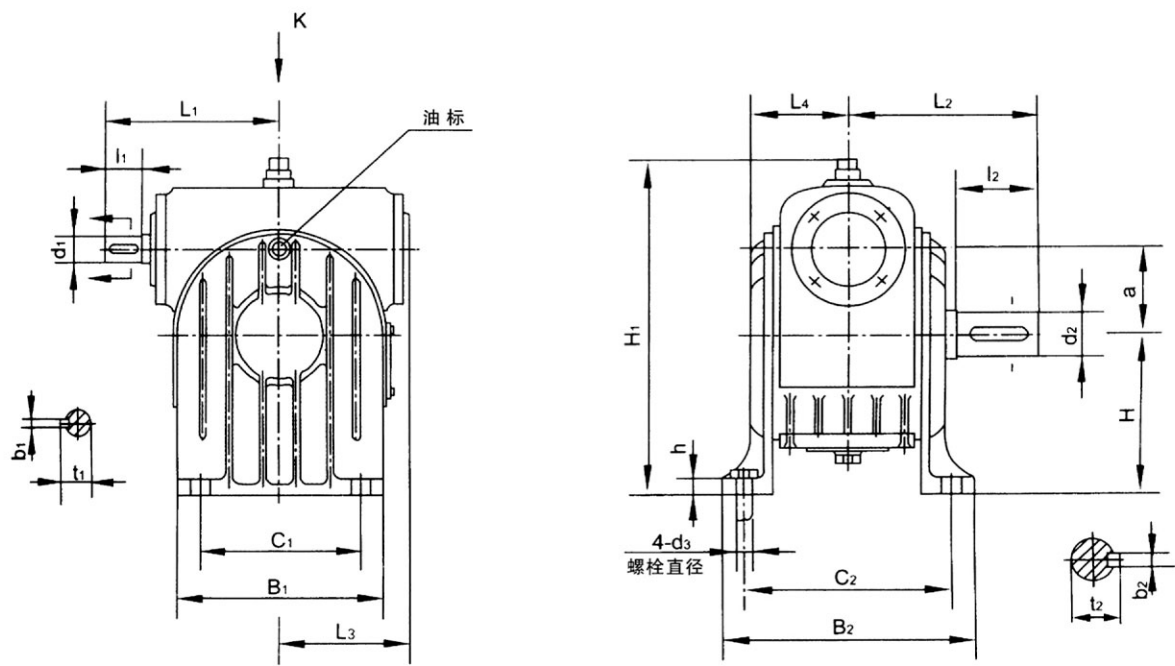
单位 (Units) : mm

型号 Type	尺寸 Size	a	D (HB)	D ₁	D ₂	L ₃	L ₄	L ₅	h	h ₁	H	i ≤ 12.5				
												d ₁	l ₁	b ₁	t ₁	L ₁
CWS125		125	230	280	320	202	134	125	32	8	132	32K6	58	10	35	218
CWS140		140	260	320	360	220	145	135	32	8	150	38K6	58	10	41	228
CWS160		160	300	360	400	245	156	142	32	8	160	42K6	82	12	45	277
CWS200		200	370	435	480	295	182	180	38	8	190	48K6	82	14	51.5	324
CWS250		250	470	540	600	360	208	210	40	8	212	55K6	82	16	59	380
CWS280		280	550	640	700	390	225	215	45	8	225	60m6	105	18	64	430
CWS315		315	605	700	760	430	242	235	50	10	250	65m6	105	18	69	470
CWS355		355	700	805	880	480	256	235	55	10	265	70m6	105	20	74.5	515
CWS400		400	765	875	950	515	278	247	60	10	265	75m6	105	20	79.5	545
CWS450		450	875	990	1070	565	300	275	65	10	315	80m6	130	22	85	625
CWS500		500	1000	1100	1180	655	344	300	75	10	375	90m6	130	25	95	680

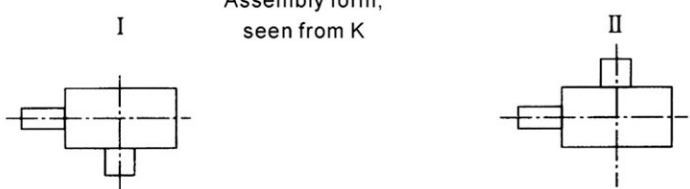
型号 Type	尺寸 Size	i ≥ 16					d ₂	l ₂	b ₂	t ₂	L ₂	l ₃	地脚螺栓 Anchor bolt		重量(kg) (不包括油重) weight (Excluding oil weight)
		d ₁	l ₁	b ₁	t ₁	L ₁							d ₃	n	
CWS125		28js6	42	8	31	202	55k6	82	16	59	222	14	M12	4	95
CWS140		28js6	42	8	31	212	60m6	105	18	64	260	15	M16	4	110
CWS160		32k6	58	10	35	253	65m6	105	18	69	270	15	M16	4	150
CWS200		38k6	58	10	41	300	80m6	130	22	85	325	17	M16	4	270
CWS250		42k6	82	12	45	380	100m6	165	28	106	385	17	M20	4	410
CWS280		48k6	82	14	51.5	407	110m6	165	28	116	405	17	M24	4	550
CWS315		48k6	82	14	51.5	447	120m6	165	32	127	420	17	M24	4	750
CWS355		55k6	82	16	59	492	130m6	200	32	137	470	17	M30	4	930
CWS400		60k6	105	18	64	545	150m6	200	36	158	490	24	M30	4	1200
CWS450		65m6	105	18	69	600	170m6	240	40	179	560	24	M36	4	1650
CWS500		70m6	105	20	74.5	655	190m6	280	45	200	640	24	M30	6	2190



CWO63-CWO100型减速器外形和安装尺寸
Overall and mounting dimensions of CWO63-CWO100 reducer



装配型式
从K向看
Assembly form,
seen from K



单位 (Units) : mm

尺寸 Size 型号 Type	a	B ₁	B ₂	C ₁	C ₂	h	H	H ₁	d ₃	i≤12.5				
										d ₁	l ₁	b ₁	t ₁	L ₁
CWO63	63	148	180	115	150	12	117	245	M12	19js6	28	6	21.5	128
CWO80	80	175	200	140	170	15	145	296	M12	24js6	36	8	27	151
CWO100	100	218	230	175	190	15	180	365	M12	28js6	42	8	31	182

型号 Type	尺寸 Size	i≥16					d ₂	l ₂	b ₂	t ₂	L ₂	L ₃	L ₄	重量(kg) (不包括油重) weight (Excluding oil weight)
		d ₁	l ₁	b ₁	t ₁	L ₁								
CWO63	19js6	28	6	21.5	128	32k6	58	10	35	135	97	70	19.5	
CWO80	24js6	36	8	27	151	38k6	58	10	41	143	110	81	28.5	
CWO100	24js6	36	8	27	176	42k6	82	12	45	182	130	95	43	

Technical drawing of the assembly form (F-with fan) of a motor, showing front, side, and end views with dimensions and labels.

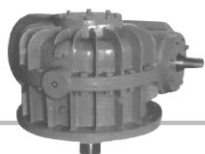
Front View (Left): Shows the motor body with dimensions L_1 , L_3 , L_5 , d_1 , a , H_1 , H , C_1 , B_1 , B_3 , and $4-d_3$ (螺栓直径). A detail view of a bolt is shown with dimensions b_1 and t_1 .

Side View (Right): Shows the motor body with dimensions L_2 , L_4 , L_2 , d_2 , l_2 , C_2 , and B_2 . A detail view of a bolt is shown with dimensions b_2 and t_2 .

End Views (Bottom): Three end views labeled I F, II F, and III F, showing the motor body from different perspectives.

Labels and Dimensions:

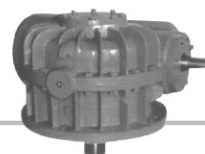
- 装配型式 (F-带风扇)
- 从A向看
- Assembly form (F-with fan), seen from K



四、CW系列圆弧圆柱蜗杆减速机的公称传动比及额定输入功率P1和额定输出扭矩和T2

Nominal transmission ratio, rated input power P1 and rated output torque T2 of CW series circular tooth and cylindrical worm gear

传动比代号 Ratio mode	公称传动比 Nominal ratio	输入转速 Input speed V1	中心距代号 center distance code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
			中心距 center distance	63	80	100	125	140	160	180	200	225	250	280	315	355	400	450	500	
			型号 Type	CWU、CWS、CWO																
			额定输入功率Plkw、额定输出扭矩 T2N.m Rated input power Plkw、Rated output torque T2N.m																	
1	5	1500	P ₁ T ₂	3.500 107	6.388 180	10.39 295	25.22 730	- -	44.58 1300	- -	64.90 1900	- -	98.44 2900	- -	141.9 4200	- -	202.4 6000	- -	-	
		1000	P ₁ T ₂	2.978 123	4.871 205	8.092 345	21.28 920	- -	35.59 1550	- -	53.68 2350	- -	91.75 4050	- -	135.7 6000	- -	193.6 8600	- -	-	
		750	P ₁ T ₂	2.577 141	4.211 235	7.010 395	15.40 940	- -	27.73 1600	- -	43.06 2500	- -	78.56 4600	- -	126.4 7400	- -	185.9 11000	- -	-	
		500	P ₁ T ₂	2.120 173	3.367 280	5.436 455	11.64 990	- -	19.81 1700	- -	31.23 2700	- -	56.14 4900	- -	104.2 9150	- -	169.4 15000	- -	-	
2	6.3	1500	P ₁ T ₂	3.198 114	5.505 200	9.258 340	21.37 800	27.51 960	38.40 1450	48.46 1700	55.38 2100	69.18 2450	83.77 3200	102.5 3650	121.7 4670	150.5 5370	137.8 7500	- -	-	
		1000	P ₁ T ₂	2.422 127	4.331 235	7.141 390	17.96 1000	24.97 1300	31.03 1750	43.85 2300	49.95 2750	64.08 3400	78.53 4500	95.58 5100	114.4 6580	145.3 7770	172.5 10500	- -	189.9 12000	
		750	P ₁ T ₂	2.090 146	3.594 260	6.138 445	14.22 1050	19.57 1350	24.73 1850	34.50 2400	27.27 3800	56.05 4000	60.81 5300	88.76 6300	107.2 8200	134.8 9590	166.5 13500	- -	183.9 15500	
		500	P ₁ T ₂	1.706 176	2.955 315	4.829 520	10.47 1150	13.65 1400	17.08 1900	24.52 2550	26.64 3000	41.03 4300	50.37 5700	67.32 7100	83.58 9540	112.5 11990	143.1 18000	- -	162.7 20500	
3	8	1500	P ₁ T ₂	2.932 127	4.866 230	7.628 365	17.01 830	24.25 1050	28.44 1450	43.51 1900	48.25 2400	61.38 2700	73.84 3700	91.68 4050	113.6 5720	136.0 5040	166.1 8400	- -	-	
		1000	P ₁ T ₂	2.255 146	3.908 275	6.144 440	13.55 990	21.70 1400	24.95 1990	39.10 2550	43.65 3250	56.13 3700	67.78 5100	84.52 5600	104.8 7910	126.7 8440	158.2 12000	174.1 12500	-	
		750	P ₁ T ₂	1.962 168	3.334 310	5.289 500	12.93 1250	16.96 1450	21.37 2150	30.61 2650	35.01 3450	50.44 4400	62.32 6200	77.46 6800	95.18 9540	114.0 10070	148.9 15000	162.4 15500	-	
		500	P ₁ T ₂	1.647 209	2.714 375	4.183 590	9.322 1350	12.25 1550	15.42 2300	21.93 2800	25.38 3700	35.91 4650	44.70 6600	61.33 8000	79.99 11921	101.7 13421	129.6 19500	147.3 21001	-	
4	10	1500	P ₁ T ₂	2.340 132	4.056 235	6.626 390	14.16 850	17.30 1050	24.50 1500	32.10 1850	42.10 2600	50.79 3250	59.13 3800	73.68 4750	94.55 5910	140.2 7480	146.2 9200	- -	-	
		1000	P ₁ T ₂	1.800 150	3.205 275	5.132 450	12.78 1150	16.05 1450	21.96 2000	29.62 2450	37.06 3400	43.94 4200	51.10 4900	64.89 6200	87.71 8200	112.4 10550	138.1 13000	162.2 14500	176.0 16500	
		750	P ₁ T ₂	1.594 170	2.729 310	4.401 510	10.54 1250	12.95 1550	17.41 2100	23.73 2700	28.83 3500	35.14 4450	46.40 4900	57.94 6200	80.74 82010	100.2 12470	132.0 16500	156.0 18500	164.1 20500	
		500	P ₁ T ₂	1.272 209	2.203 370	3.542 610	7.714 1350	9.355 1650	12.88 2300	16.98 2850	20.87 3750	26.401 4960	35.62 6700	45.57 8600	64.70 11920	82.81 15340	118.1 22000	137.8 24500	147.4 27500	
5	12.5	1500	P ₁ T ₂	2.036 137	3.534 240	5.579 385	11.27 800	14.74 1000	19.23 1400	25.36 1800	32.62 2450	42.61 3050	52.23 3850	71.95 5200	79.91 6100	105.1 8050	130.4 10000	- -	-	
		1000	P ₁ T ₂	1.594 159	2.840 285	4.465 460	9.919 1050	13.37 1350	17.63 1900	23.21 2450	29.04 3250	38.43 4100	47.23 5200	66.84 7200	73.88 8300	96.65 11030	127.1 14500	152.5 17000	183.3 20500	
		750	P ₁ T ₂	1.370 182	2.482 325	3.977 540	8.946 1250	11.91 1600	15.38 2200	21.05 2950	24.93 3700	35.26 5000	44.42 6500	62.16 8900	69.26 10500	91.39 13900	118.3 18000	141.2 21000	174.3 26000	
		500	P ₁ T ₂	1.126 223	1.967 390	3.121 630	6.791 1400	9.104 1800	11.16 2350	16.00 3300	17.60 3850	27.75 5800	32.91 7100	45.05 9500	55.40 12400	76.37 17200	101.3 23000	102.2 28000	157.3 35000	
6	16	1500	P ₁ T ₂	1.728 137	3.019 250	4.930 415	11.06 960	13.63 1200	19.62 1750	23.11 2200	33.22 3000	39.52 3700	46.71 4250	57.25 5400	77.70 7150	94.45 8920	124.2 11500	- -	-	
		1000	P ₁ T ₂	1.659 159	2.375 290	3.820 480	9.651 1250	12.26 1600	16.27 2150	19.81 2800	25.78 3450	30.39 4300	41.99 5700	51.15 7200	72.91 10020	86.88 11990	115.4 16000	127.4 18000	151.4 21500	
		750	P ₁ T ₂	1.170 182	2.203 325	3.326 550	7.871 1350	9.877 1700	12.97 2250	15.60 2900	20.64 3650	26.61 4900	37.26 6700	45.01 8400	65.59 11920	83.05 15340	106.4 19500	122.6 23000	142.9 27000	
		500	P ₁ T ₂	0.963 228	1.664 400	2.61 650	5.677 1400	6.930 1750	9.124 2350	11.397 3150	14.868 3900	18.69 5100	27.11 7200	33.09 9100	47.75 12880	61.95 16780	86.09 23500	109.3 30500	128.2 36000	



传动比代号 Ratio mode	公称传动比 Nominal ratio	输入转速 Input speed W1	中心距代号 center distance code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
			中心距 center distance	63	80	100	125	140	160	180	200	225	250	280	315	355	400	450	500
			型号 Type	CWU、CWS、CWO															
				额定输入功率Plkw、额定输出扭矩 T2N.m Rated input power Plkw、Rated output torque T2N.m															
7	20	1500	P ₁ T ₂	1.677 164	2.680 285	4.210 455	8.592 970	11.05 1200	15.12 1750	19.39 2150	24.97 2950	31.94 3600	41.91 5000	51.71 5900	62.42 7540	80.82 9300	98.76 12000	- -	- -
		1000	P ₁ T ₂	1.329 191	2.904 330	2.121 540	17.77 1250	9.301 1500	13.05 2250	16.70 2750	21.97 3850	27.088 4550	37.65 6700	45.95 8000	58.25 10490	75.23 12950	90.92 16500	120.8 22000	112.0 26000
		750	P ₁ T ₂	1.147 219	1.825 380	2.957 630	6.915 1500	8.694 1850	11.45 2600	14.75 3200	18.14 4200	24.38 5400	34.87 8200	43.07 9700	52.03 12400	69.41 15820	83.01 20000	113.6 27500	131.5 32000
		500	P ₁ T ₂	0.873 246	1.466 450	2.278 710	5.1241 1650	6.478 2000	8.613 2850	10.81 3450	13.18 4500	18.06 5900	25.45 8800	31.64 10500	40.69 14310	54.29 18220	72.97 26000	99.07 35500	118.1 42500
8	25	1500	P ₁ T ₂	1.205 141	2.152 275	3.531 445	6.526 890	8.323 1150	11.82 1600	14.19 2050	18.38 2650	22.32 3300	30.80 4500	38.03 5600	51.46 7340	67.70 10070	83.69 12500	- -	- -
		1000	P ₁ T ₂	1.012 178	1.778 340	2.890 540	5.332 1100	6.796 1400	10.42 2100	12.09 2600	16.44 3500	19.86 4350	27.53 6000	35.05 7700	44.90 9540	60.58 13420	74.13 16500	90.13 20500	91.30 20500
		750	P ₁ T ₂	0.824 191	1.51 6380	2.340 590	4.877 1300	6.108 1650	9.484 2500	11.129 3150	14.76 4150	17.95 5200	25.08 7200	31.69 9200	42.47 11920	57.17 16780	69.46 20500	84.46 25500	85.55 25500
		500	P ₁ T ₂	0.600 205	1.164 435	1.836 670	3.575 1400	4.403 1750	6.831 2650	8.050 3350	11.65 4800	14.05 6000	20.11 8500	25.81 1100	35.78 14780	46.72 20140	60.79 26500	74.00 33000	78.62 34500
9	31.5	1500	P ₁ T ₂	1.054 146	1.809 260	2.901 430	7.208 1100	8.413 1350	12.14 2000	14.47 2550	21.53 3600	24.69 4300	28.73 4900	35.02 6200	50.41 8780	65.58 11500	- -	- -	- -
		1000	P ₁ T ₂	0.829 168	1.445 305	2.285 510	5.730 1300	6.738 1600	9.325 2250	11.13 2900	16.47 3700	18.48 4800	25.65 6500	30.75 8100	46.21 11920	58.96 15340	74.43 19500	95.59 26000	117.0 33000
		750	P ₁ T ₂	0.689 187	1.223 340	1.973 570	4.548 1350	4.573 1700	7.469 2350	8.868 3000	11.95 3850	14.91 5000	21.21 7000	25.35 8800	36.44 12400	48.81 16780	67.04 23500	82.46 29500	109.0 40500
		500	P ₁ T ₂	0.581 228	1.021 410	1.588 670	3.284 2400	3.879 1750	5.332 2450	6.568 3250	8.700 4100	10.93 5400	15.30 7400	18.47 9300	26.79 13350	34.13 17260	48.87 25000	60.39 32000	79.15 43500
10	40	1500	P ₁ T ₂	1.015 178	1.634 300	2.559 485	5.451 1100	6.917 1350	9.506 2000	11.77 2450	15.87 3450	20.10 4300	26.95 6000	33.33 7100	40.55 9160	55.49 11990	67.48 15500	- -	- -
		1000	P ₁ T ₂	0.780 196	1.2770 345	2.087 590	4.670 1400	5.889 1700	8.384 2600	10.35 3150	13.24 4200	17.18 5400	22.99 7800	29.94 9400	37.26 12400	49.51 15820	63.11 21500	81.63 28000	99.56 34500
		750	P ₁ T ₂	0.704 228	1.095 390	1.812 670	4.159 1600	5.222 1950	6.691 2200	8.296 3300	10.709 4450	14.08 5800	19.78 8500	24.15 10000	32.39 14310	40.70 17260	57.84 26000	74.94 34000	93.04 42500
		500	P ₁ T ₂	0.544 259	0.844 455	1.387 730	3.053 1700	3.770 2050	4.984 2900	6.147 3550	7.662 4650	10.48 6300	14.46 9000	18.34 11000	23.85 15260	30.06 18700	44.58 29500	56.40 37500	70.53 47500
11	50	1500	P ₁ T ₂	0.787 159	1.430 310	2.182 480	4.226 990	5.339 1300	7.295 1800	8.872 2300	12.07 3100	14.44 3900	20.33 5300	25.42 6900	32.07 8580	43.13 11990	53.65 15000	- -	- -
		1000	P ₁ T ₂	0.641 191	1.144 360	1.787 570	3.606 1250	4.439 1600	6.441 2350	7.795 3000	10.48 4000	13.36 5300	18.10 7000	22.34 9000	29.83 11920	39.61 16300	49.63 20500	61.38 26000	65.33 28000
		750	P ₁ T ₂	0.525 205	0.966 405	1.511 640	3.221 1450	3.889 1800	5.829 2750	6.992 3500	9.088 4450	11.38 5900	16.18 8200	20.76 11000	27.24 14300	36.30 19600	45.94 25000	57.13 32000	60.92 34500
		500	P ₁ T ₂	0.395 223	0.730 455	1.117 700	2.300 1500	2.803 1900	4.326 2950	5.131 3700	6.790 4850	8.235 6200	12.61 9200	15.77 12000	21.44 16220	28.74 22530	38.14 30500	47.08 39000	54.19 45500
12	63	1500	P ₁ T ₂	- -	1.175 280	1.782 450	3.332 890	4.452 1200	5.650 1650	7.709 2250	9.966 3000	13.17 3900	15.31 4600	20.20 6100	25.06 7820	33.84 10550	45.41 14500	- -	- -
		1000	P ₁ T ₂	- -	0.865 300	1.402 510	2.488 970	3.394 1350	4.221 800	6.399 2750	7.787 3400	11.57 5000	13.39 5900	20.37 8100	22.77 10490	30.32 14380	42.56 20000	50.59 24000	64.58 31000
		750	P ₁ T ₂	- -	0.709 325	1.152 550	2.147 1100	2.889 1500	3.691 2050	5.14 2900	6.825 2900	9.659 5500	11.60 6700	15.45 9100	20.40 12400	29.52 17740	37.78 23500	47.20 29500	59.58 38000
		500	P ₁ T ₂	- -	0.574 390	0.900 630	1.701 1250	2.281 1700	2.878 2300	4.251 3400	5.302 4400	7.260 6000	8.654 7200	11.85 10000	15.84 13830	21.75 19180	28.77 26000	35.93 33000	46.28 43500