



PLANETARY GEAR BOX

ZB/ZBR/ZE/HD系列
高精度行星减速机



Zhongda Realizes the infinite possible in automation application

宁波中大力德智能传动股份有限公司成立于2006年8月，是一家集电机驱动、微特电机、精密减速器的研发、制造、销售、服务于一体的国家级高新技术企业。企业拥有全资子公司2家，分公司2家，员工1400人，占地面积100亩；2017年8月29日在深交所中小板A股上市（股票代码002896）。

主要产品有微型直流齿轮减速电机、微型交流齿轮减速电机、小型交流齿轮减速电机、行星减速器、精密摆线针轮减速器、电机控制器等。主导和参与起草国家及行业标准6项，“浙江制造”标准1项，专利87项，拥有浙江省级企业研发中心，主导产品被认定为“浙江省名牌产品”、“行业质量可信产品”，行星减速器被国家科学技术部认定为“国家重点新产品”。

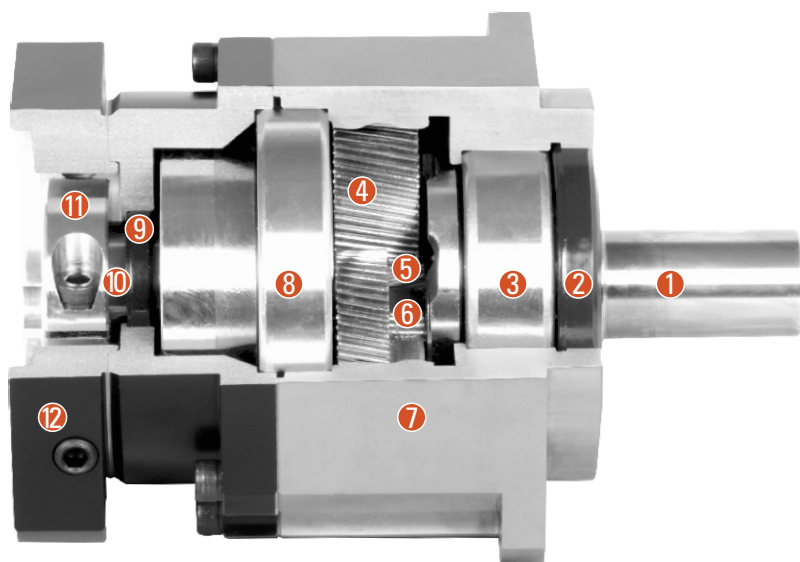
Ningbo Zhongda Leader Intelligent Transmission Co., Ltd (ZD-Motor) was established in 2006, which is a national high-tech enterprise, specialized in motor drivers, micro motors, precision gearboxes, and integrated the R&D, manufacturing, marketing, service. The company has 2 wholly-owned subsidiaries, 2 branches and 1400 employees, covering an area of 66,666 square meters. The company went public on the Shenzhen Stock Exchange SME board (Ticker symbol 002896) on 29th August 2017.

The main products are micro DC gearmotor, micro AC gearmotor, small AC gearmotor, planetary reducer, precision cycloid reducer, motor controller and so on. ZD-motor is leading and participating in the drafting of 6 national and industry standards, gets 1 standard of “Zhejiang Manufacturing”, and 87 patents; equipped the Zhejiang provincial enterprise R&D center. The mainly products were identified as “Zhejiang Famous Brand Products” and “Industry Quality Credible Products”. The planetary reducer was recognized by the Ministry of Science and Technology as a “National Key New Product”.

ZB系列减速机

ZB SERIES GEAR BOX

剖视图 Sectional Drawing



- ① 输出轴 Output shaft
- ② 油封 Oil seal
- ③ 输出轴前轴承 Output shaft front bearing
- ④ 行星轮 Planetary gear
- ⑤ 太阳轮 Solar wheel
- ⑥ 满针轴承 Full needle bearing
- ⑦ 前盖 Front cover
- ⑧ 输出轴后轴承 Output shaft rear bearing
- ⑨ 油封 Oil seal
- ⑩ 联轴器 Coupling
- ⑪ 锁紧环 Lock ring
- ⑫ 后盖 Rear cover

系列号、机座标识说明 Type And Model Number

ZB减速机 ZB Reducers	伺服电机 Servo Motor
090 ZB 20 () (S1) - 750 <input type="text"/>	
① ② ③ ④ ⑤ ⑥ ⑦	
① 减速机机座号: 090 具体见P04 ② 减速机系列代号: ZB ③ 减速比: 20 具体见P04 ④ 精度 具体见P04 标准型P2(省略) 精密型P1 高精型P0 输出轴负荷量为容许输出扭矩的±5%时的值	Gear head frame size: 090, (P04) Gear head series code: ZB Gear ratio: Single stage 20, (P04) Amount of backlash, (P04) Standard type P2 (Omission), precision P1, high precision P0 Precision (The load of output shaft is ±5% of allowable output torque)
⑤ 输入轴型式 S1: 带锁紧环锁紧(省略) (无论马达是否有键槽都可用, 但“D”字型不适用) S2: 带键槽锁紧(输入轴带键) A: 其他适配器(请与本公司联系)	Input shaft type S1: Locking with locking ring (Omission) (Regardless whether the motor with keyway can use it. But “D” cut can't use) S2: Locking with keyway (Input shaft with key) A: Other type (Please contact with us)
⑥ 适用伺服马达功率(W)	Applicable servo motor power (W)
⑦ 伺服马达型号	Model of servo motor

产品规格

PRODUCT SPECIFICATIONS

■ 减速机性能资料 Reducer Performance Data

规格 Specifications	级数 Node Number	减速比 Reduction Ratio	060ZB	060(A)ZB	090ZB	090(A)ZB	115ZB	142ZB	180ZB	220ZB	
额定输出力矩 T_{2N}	Nm	1	3	55	-	130	-	208	342	588	1140
			4	50	-	140	-	290	542	1050	1700
			5	60	-	160	-	330	650	1200	2000
			6	55	-	150	-	310	600	1100	1900
			7	50	-	140	-	300	550	1100	1800
			8	45	-	120	-	260	500	1000	1600
			9	40	-	100	-	230	450	900	1500
			10	40	-	100	-	230	450	900	1500
			15	55	55	130	130	208	342	588	1140
			20	50	50	140	140	290	542	1050	1700
	25	60	60	160	160	330	650	1200	2000		
	30	55	55	150	150	310	600	1100	1900		
	35	50	50	140	140	300	550	1100	1800		
	40	45	45	120	120	260	500	1000	1600		
	45	40	40	100	100	230	450	900	1500		
	50	60	60	160	160	330	650	1200	2000		
	60	55	55	150	150	310	600	1100	1900		
	70	50	50	140	140	300	550	1100	1800		
	80	45	45	120	120	260	500	1000	1600		
90	40	40	100	100	230	450	900	1500			
100	40	40	100	100	230	450	900	1500			
急停扭矩 T_{2NOT}^2	Nm	1,2	3倍额定输出力矩								
额定输入转速 n_{1N}	rpm	1,2	5000	5000	4000	4000	4000	3000	3000	2000	
最大输入转速 n_{1B}	rpm	1,2	3~100	10000	10000	8000	8000	8000	6000	6000	4000
超精密回程精度 P0	arcmin	1	3~10	-	-	-	-	≤1	≤1	≤1	≤1
		2	15~100	-	-	-	-	≤3	≤3	≤3	≤3
精密回程精度 P1	arcmin	1	3~10	≤3	-	≤3	-	≤3	≤3	≤3	≤3
		2	15~100	-	≤5	≤5	≤5	≤5	≤5	≤5	≤5
标准回程精度 P2	arcmin	1	3~10	≤5	-	≤5	-	≤5	≤5	≤5	≤5
		2	15~100	-	≤7	≤7	≤7	≤7	≤7	≤7	≤7
扭转刚性	Nm/arcmin	1,2	3~100	7	7	14	14	25	50	145	225
容许径向力 F_{2B}^3	N	1,2	3~100	1530	1530	3250	3250	6700	9400	14500	50000
容许轴向力 F_{2aB}^3	N	1,2	3~100	765	765	1625	1625	3350	4700	7250	25000
使用寿命	hr	1,2	20000*								
效率 η	%	1	≥97%								
		2	≥94%								
重量	Kg	1	3~10	1.3	-	3.7	-	7.8	14.5	29	48
		2	15~100	1.5	1.9	4.1	5.3	9	17.5	33	60
使用温度	°C	1,2	-10°C~+90°C								
润滑		1,2	合成润滑油脂								
防护等级		1,2	IP65								
安装方向		1,2	任意方向								
噪音值 距离1m ($n_1=3000rpm$, 无负载)	dB(A)	1,2	3~100	≤58	≤60	≤60	≤63	≤63	≤65	≤67	≤70

■ 减速机转动惯量 Moment Of Inertia Of The Reducer

规格 Specifications	级数 Node Number	减速比 Reduction Ratio	060ZB	060(A)ZB	090ZB	090(A)ZB	115ZB	142ZB	180ZB	220ZB	
转动惯量 J_1	Kg·cm ²	1	3	0.16	-	0.61	-	3.25	9.21	28.98	69.61
			4	0.14	-	0.48	-	2.74	7.54	23.67	54.37
			5	0.13	-	0.47	-	2.71	7.42	23.29	53.27
			6	0.13	-	0.45	-	2.65	7.25	22.75	51.72
			7	0.13	-	0.45	-	2.62	7.14	22.48	50.97
			8	0.13	-	0.44	-	2.58	7.07	22.59	50.84
			9	0.13	-	0.44	-	2.57	7.04	22.53	50.63
			10	0.13	-	0.44	-	2.57	7.03	22.51	50.56
			15	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29
			20	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29
	25	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29		
	30	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29		
	35	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29		
	40	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29		
	45	0.03	0.13	0.13	0.47	0.47	2.71	7.42	23.29		
	50	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51		
	60	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51		
	70	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51		
	80	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51		
	90	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51		
100	0.03	0.13	0.13	0.44	0.44	2.57	7.03	22.51			

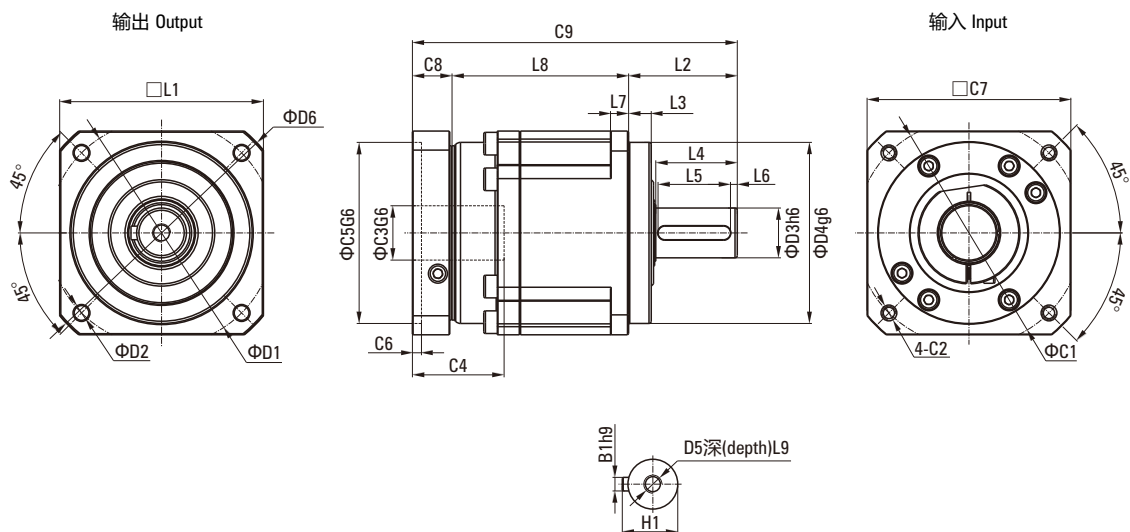
1. 减速比($i=N_1/N_{out}$)2. 最大加速力矩 $T_{2B}=60\%$ of T_{2NOT}

3. 输出转速100rpm时, 作用于输出轴中心位置。

*连续运转, 使用寿命为10000hrs

尺寸(单级, 减速比 $i=3\sim 10$) DIMENSIONS (SINGLE SEGMENT, REDUCTION RATIO $i=3\sim 10$)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

[单位Unit: mm]

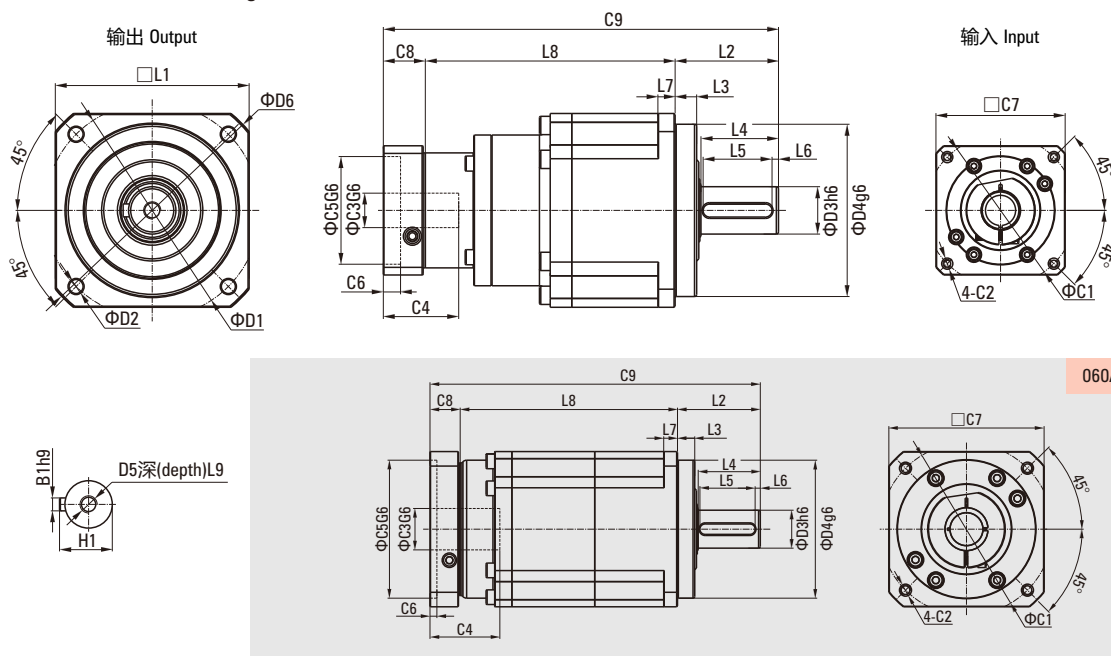
尺寸Size	060ZB	090ZB	115ZB	142ZB	180ZB	220ZB
D1	70	100	130	165	215	250
D2	5.5	6.6	9	11	13	17
D3 ^{h6}	16	22	32	40	55	75
D4 ^{g6}	50	80	110	130	160	180
D5	M5×0.8P	M8×1.25P	M12×1.75P	M16×2P	M20×2.5P	M20×2.5P
D6	80	116	152	185	240	292
L1	60	90	115	142	180	220
L2	37	48	65	97	105	138
L3	7	10	12	15	20	30
L4	28	35.5	51	79	82	105
L5	25	32	40	70	70	90
L6	2	2	5	4	6	7
L7	6	8	10	15	20	25
L8	65.5	78	101.5	119.5	154	163.5
L9	12.5	19	28	36	42	42
C1	70	100	130	165	215	235
C2	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P	M12×1.75P
C3	*≤14/≤16	≤19/≤24	≤32	≤35/≤38	≤42/≤48	≤55
C4	35	40.5	51	60	85	116
C5 ^{g6}	50	80	110	130	180	200
C6	8	4	5	6	6	6
C7	60	90	115	142	190	220
C8	19.5	17.5	20	22.5	29	63
C9	122	143.5	186.5	239	288	364.5
B1 ^{h9}	5	6	10	12	16	20
H1	18	24.5	35	43	59	79.5

*060ZB 5,10 减速比提供C3≤16可选。

尺寸(两级, 减速比 $i=15\sim 100$)

DIMENSIONS (DOUBLR, REDUCTION RATIO $i=15\sim 100$)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

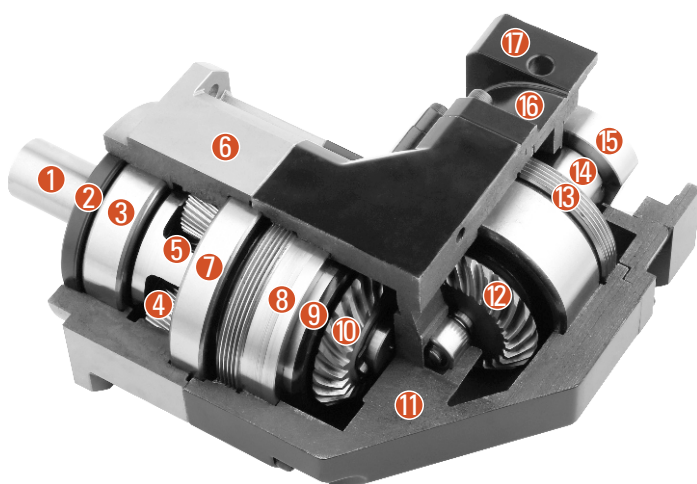
[单位Unit: mm]

尺寸Size	060AZB	090ZB	090AZB	115ZB	142ZB	180ZB	220ZB
D1	70	100	130	165	215	250	
D2	5.5	6.6	9	11	13	17	
D3 ^{h6}	16	22	32	40	55	75	
D4 ^{g6}	50	80	110	130	160	180	
D5	M5×0.8P	M8×1.25P	M12×1.75P	M16×2P	M20×2.5P	M20×2.5P	
D6	80	116	152	185	240	292	
L1	60	90	115	142	180	220	
L2	37	48	65	97	105	138	
L3	7	10	12	15	20	30	
L4	28	36	51	79	82	105	
L5	25	32	40	70	70	90	
L6	2	3	5	4	6	7	
L7	6	8	10	15	20	25	
L8	102.5	116	126	143	169.5	207.5	246
L9	12.5	19	28	36	42	42	
C1	70	70	100	100	130	165	215
C2	M5×0.8P	M5×0.8P	M6×1P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P
C3	≤14/≤16	≤14/≤15.875/≤16	≤19/≤24	≤19/≤24	≤32	≤35/≤38	≤42/≤48
C4	35	35	40.5	40	50	60	85
C5 ^{g6}	50	50	80	80	110	130	180
C6	8	8	4	4	5	6	6
C7	60	60	90	90	115	142	190
C8	19.5	19.5	17.5	17.5	12.5	22.5	29
C9	159	183.5	191.5	225.5	283.5	335	409
B1 ^{h9}	5	6	10	12	16	20	
H1	18	24.5	35	43	59	79.5	

ZBR系列减速机-产品规格

ZBR SERIES GEAR BOX - PRODUCT SPECIFICATIONS

剖视图 Sectional Drawing



- ① 输出轴 Output shaft
- ② 油封 Oil seal
- ③ 输出轴前轴承 Output shaft front bearing
- ④ 行星轮 Planetary gear
- ⑤ 太阳轮 Solar wheel
- ⑥ 前盖 Front cover
- ⑦ 输出轴后轴承 Output shaft rear bearing
- ⑧ 调节螺母 Adjusting nut
- ⑨ 双列角接触轴承 Double row angular contact bearing
- ⑩ 输出锥齿轮 Output bevel gear
- ⑪ 直角箱体 Right angle box
- ⑫ 输入锥齿轮 Input bevel gear
- ⑬ 锁紧螺母 Lock nut
- ⑭ 输入联轴器 Input coupling
- ⑮ 锁紧器 Locking device
- ⑯ 后盖 Rear cover
- ⑰ 后盖垫片 Rear cover gasket

减速机性能资料 Reducer Performance Data

规格 Specifications		级数 Node Number	减速比 Reduction Ratio	060ZBR	090ZBR	115ZBR	142ZBR	180ZBR
额定输出力矩 T_{2N}	Nm	1	3	36	90	195	342	588
			4	48	120	260	520	1040
			5	60	150	325	650	1200
			6	55	150	310	600	1100
			7	50	140	300	550	1100
			8	45	120	260	500	1000
			9	40	100	230	450	900
			10	40	100	230	450	900
			14	42	140	300	550	1100
20	40	100	230	450	900			
急停扭矩 T_{2TOT}	Nm	1	3~200	3倍额定输出力矩				
额定输入转速 n_{1N}	rpm	1	3~200	5000	4000	4000	3000	3000
最大输入转速 n_{1B}	rpm	1	3~200	10000	8000	8000	6000	6000
超精密背隙 P0	arcmin	1	3~20	-	≤2	≤2	≤2	≤2
精密背隙 P1	arcmin	1	3~20	≤4	≤4	≤4	≤4	≤4
标准背隙 P2	arcmin	1	3~20	≤6	≤6	≤6	≤6	≤6
扭转刚性	Nm/arcmin	1	3~200	7	14	25	50	145
容许径向力 F_{2R}	N	1	3~200	1530	3250	6700	9400	14500
容许轴向力 F_{2A18}	N	1	3~200	630	1300	3000	4000	6200
容许轴向力 F_{2A28}	N	1	3~200	765	1625	3350	4700	7250
使用寿命	hr	1	3~200	20000*				
效率 η	%	1	3~20	≥95%				
重量	Kg	1	3~20	2.1	6.4	13	24.5	51
使用温度	°C	1	3~200	-10°C ~ +90°C				
润滑		1	3~200	合成润滑油脂				
防护等级		1	3~200	IP65				
安装方向		1	3~200	任意方向				
噪音值 距离1m ($n_1=3000$ rpm,无负载)	dB(A)	1	3~200	≤63	≤65	≤68	≤70	≤72

减速机转动惯量 Moment Of Inertia Of The Reducer

规格 Specifications		级数 Node Number	减速比 Reduction Ratio	060ZBR	090ZBR	115ZBR	142ZBR	180ZBR
转动惯量 J_1	Kg·cm ²	1	3~10	0.35	2.25	6.84	23.4	68.9
			14	0.07	1.87	6.25	21.8	65.6
			20	0.07	1.87	6.25	21.8	65.6

1. 减速比($i=N_1/N_{out}$)

2. 最大加速力矩 $T_{2B}=60\%$ of T_{2TOT}

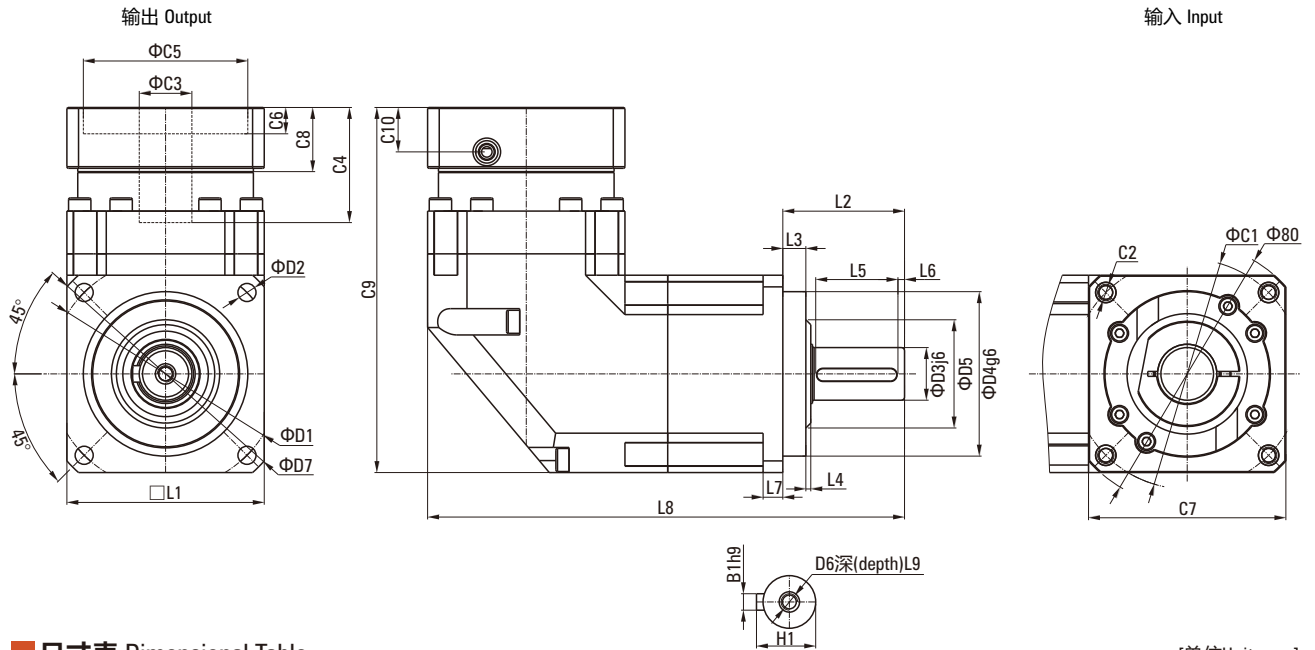
3. 输出转速100rpm时, 作用于输出轴中心位置。

*连续运转, 使用寿命为10000hrs

尺寸(单级, 减速比 $i=3\sim 20$)

DIMENSIONS (SINGLE SEGMENT, REDUCTION RATIO $i=3\sim 20$)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

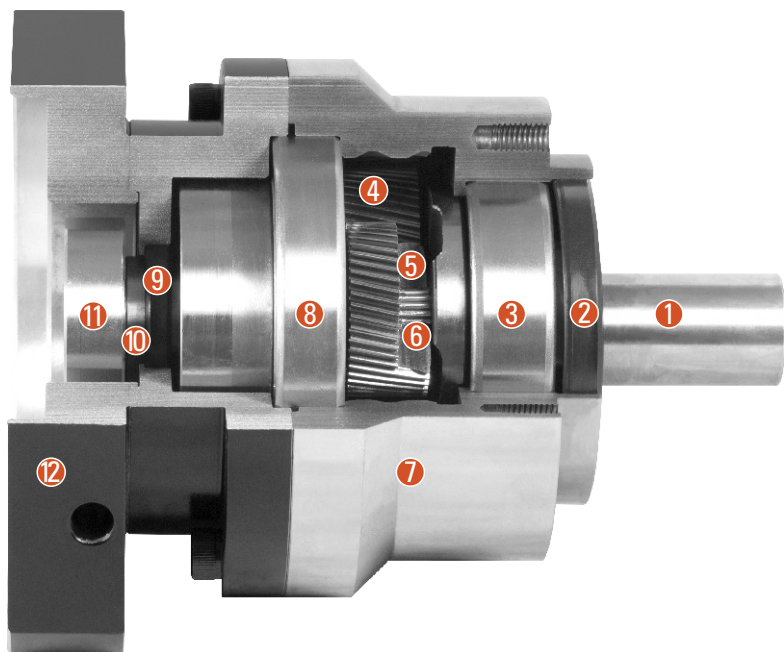
[单位Unit: mm]

尺寸Size	060ZBR	090ZBR	115ZBR	142ZBR	180ZBR
D1	70	100	130	165	215
D2	5.5	6.6	9	11	13
D3 ^{h6}	16	22	32	40	55
D4 ^{g6}	50	80	110	130	160
D5	45	65	95	75	95
D6	M5×0.8P	M8×1.25P	M12×1.75P	M16×2P	M20×2.5P
D7	80	116	152	185	240
L1	60	90	115	142	180
L2	37	48	65	97	105
L3	7	10	12	15	20
L4	1.5	1.5	2	3	3
L5	25	32	40	63	70
L6	2	3	5	5	6
L7	6	8	10	12	15
L8	145	203	259	333	394
L9	12.5	19	28	36	42
C1 ^d	70	100	130	165	215
C2 ^d	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P
C3 ^d	*≤14/≤16	≤19/≤24	≤32	≤38	≤48
C4 ^d	30	40	50	60	85
C5 ^d _{h6}	50	80	110	130	180
C6 ^d	8	4	5	6	6
C7 ^d	60	90	115	142	190
C8 ^d	19	17	19.5	22.5	29
C9 ^d	111.5	152.5	191.5	235.5	303.5
C10 ^d	13.5	10.75	13	15	20.75
B1 ^{h9}	5	6	10	12	16
H1	18	24.5	35	43	59

*070ZBR 5,10 减速比提供C3≤16可选。

ZE系列减速机 ZE SERIES GEAR BOX

剖视图 Sectional Drawing



- ① 输出轴 Output shaft
- ② 油封 Oil seal
- ③ 输出轴前轴承 Output shaft front bearing
- ④ 行星轮 Planetary gear
- ⑤ 太阳轮 Solar wheel
- ⑥ 满针轴承 Full needle bearing
- ⑦ 前盖 Front cover
- ⑧ 输出轴后轴承 Output shaft rear bearing
- ⑨ 油封 Oil seal
- ⑩ 联轴器 Coupling
- ⑪ 锁紧环 Lock ring
- ⑫ 后盖 Rear cover

系列号、机座标识说明 Type And Model Number

ZE减速机 ZE Reducers					伺服电机 Servo Motor		
090	ZE	20	()	(S1)	-	750	<input type="text"/>
①	②	③	④	⑤		⑥	⑦
① 减速机机座号: 090 具体见P10	② 减速机系列代号: ZE	③ 减速比: 20 具体见P10	④ 精度 具体见P10 标准型P2(省略) 精密型P1 高精型P0 输出轴负荷量为容许输出扭矩的±5%时的值	⑤ 输入轴型式 S1: 带锁紧环锁紧(省略) (无论马达是否有键槽都可使用, 但“D”字型不适用) S2: 带键槽锁紧(输入轴带键) A: 其他适配器(请与本公司联系)		⑥ 适用伺服马达功率(W)	⑦ 伺服马达型号
				Input shaft type S1: Locking with locking ring (Omission) (Regardless whether the motor with keyway can use it. But “D” cut can’t use) S2: Locking with keyway (Input shaft with key) A: Other type (Please contact with us)			
				Amount of backlash, (P10) Standard type P2 (Omission), precision P1, high precision P0 Precision (The load of output shaft is ±5% of allowable output torque)			
				Gear head frame size: 090, (P10) Gear head series code: ZE Gear Ratio: Single Stage 20, (P10)			

产品规格

PRODUCT SPECIFICATIONS

■ 减速机性能资料 Reducer Performance Data

规格 Specifications		级数 Node Number	减速比 Reduction Ratio	070ZE	090ZE	120ZE	155ZE	205ZE	235ZE	
额定输出力矩 T_{2N}	Nm	1	3	55	130	208	342	588	1140	
			4	50	140	290	542	1050	1700	
			5	60	160	330	650	1200	2000	
			6	55	150	310	600	1100	1900	
			7	50	140	300	550	1100	1800	
			8	45	120	260	500	1000	1600	
			9	40	100	230	450	900	1500	
			10	40	100	230	450	900	1500	
			2	15	55	130	208	342	588	1140
				20	50	140	290	542	1050	1700
		25		60	160	330	650	1200	2000	
		30		55	150	310	600	1100	1900	
		35		50	140	300	550	1100	1800	
		40		45	120	260	500	1000	1600	
		45		40	100	230	450	900	1500	
		50		60	160	330	650	1200	2000	
		60		55	150	310	600	1100	1900	
		70	50	140	300	550	1100	1800		
		80	45	120	260	500	1000	1600		
90	40	100	230	450	900	1500				
100	40	100	230	450	900	1500				
急停扭矩 T_{2NOT}^2	Nm	1,2	3倍额定输出力矩							
额定输入转速 n_{in}	rpm	1,2	3~100	5000	4000	4000	3000	3000	3000	
最大输入转速 n_{is}	rpm	1,2	3~100	10000	8000	8000	6000	6000	4000	
标准回程精度	arcmin	1	3~10	≤8	≤8	≤8	≤8	≤8	≤8	
		2	15~100	≤12	≤12	≤12	≤12	≤12	≤12	
扭转刚性	Nm/arcmin	1,2	3~100	7	14	25	50	145	225	
容许径向力 F_{2R}^3	N	1,2	3~100	1377	2985	6100	8460	13050	8700	
容许轴向力 F_{2a}^3	N	1,2	3~100	765	1625	3350	4700	7250	18000	
使用寿命	hr	1,2	3~100	20000*						
效率 η	%	1	3~10	≥97%						
		2	15~100	≥94%						
重量	Kg	1	3~10	1.4	3.3	6.9	13	31	53	
		2	15~100	1.6	4.7	8.7	17	35	66	
使用温度	°C	1,2	3~100	-10°C~+90°C						
润滑		1,2	3~100	合成润滑油脂						
防护等级		1,2	3~100	IP65						
安装方向		1,2	3~100	任意方向						
噪音值 距离1m ($n_1=3000\text{rpm}$,无负载)	dB(A)	1,2	3~100	≤58	≤60	≤63	≤65	≤67	≤70	

■ 减速机转动惯量 Moment Of Inertia Of The Reducer

规格 Specifications		级数 Node Number	减速比 Reduction Ratio	070ZE	090ZE	120ZE	155ZE	205ZE	235ZE	
转动惯量 J_1	Kg-cm ²	1	3	0.16	0.61	3.25	9.21	28.98	69.61	
			4	0.14	0.48	2.74	7.54	23.67	54.37	
			5	0.13	0.47	2.71	7.42	23.29	53.27	
			6	0.13	0.45	2.65	7.25	22.75	51.72	
			7	0.13	0.45	2.62	7.14	22.48	50.97	
			8	0.13	0.44	2.58	7.07	22.59	50.84	
			9	0.13	0.44	2.57	7.04	22.53	50.63	
			10	0.13	0.44	2.57	7.03	22.51	50.56	
			2	15	0.03	0.13	0.47	2.71	7.42	23.29
				20	0.03	0.13	0.47	2.71	7.42	23.29
		25		0.03	0.13	0.47	2.71	7.42	23.29	
		30		0.03	0.13	0.47	2.71	7.42	23.29	
		35		0.03	0.13	0.47	2.71	7.42	23.29	
		40		0.03	0.13	0.47	2.71	7.42	23.29	
		45		0.03	0.13	0.47	2.71	7.42	23.29	
		50		0.03	0.13	0.44	2.57	7.03	22.51	
		60		0.03	0.13	0.44	2.57	7.03	22.51	
		70	0.03	0.13	0.44	2.57	7.03	22.51		
		80	0.03	0.13	0.44	2.57	7.03	22.51		
90	0.03	0.13	0.44	2.57	7.03	22.51				
100	0.03	0.13	0.44	2.57	7.03	22.51				

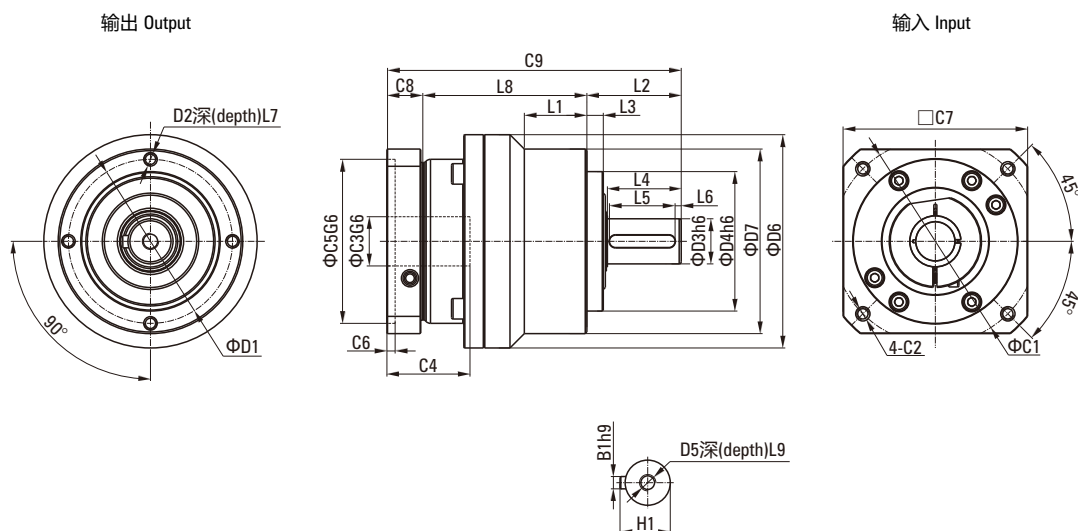
1. 减速比($i=N_1/N_{out}$)2. 最大加速力矩 $T_{2B}=60\%$ of T_{2NOT}

3. 输出转速100rpm时, 作用于输出轴中心位置。

*连续运转, 使用寿命为10000hrs

尺寸(单级, 减速比 $i=3\sim 10$) DIMENSIONS (SINGLE SEGMENT, REDUCTION RATIO $i=3\sim 10$)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

[单位Unit: mm]

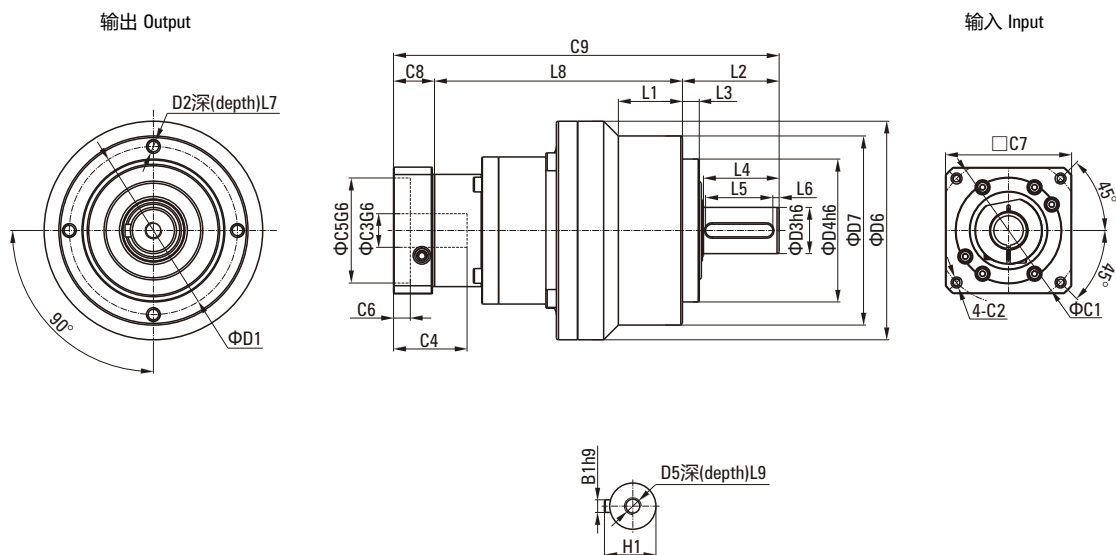
尺寸Size	070ZE	090ZE	120ZE	155ZE	205ZE	235ZE
D1	62	80	108	140	184	210
D2	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P	M16×2P
D3 ^{h6}	16	22	32	40	55	75
D4 ^{g6}	52	68	90	120	160	180
D5	M5×0.8P	M8×1.25P	M12×1.75P	M16×2P	M20×2.5P	M20×2.5P
D6	70	104	130	162	205	260
D7	70	90	120	155	205	235
L1	-	31.5	36	50	-	70
L2	36	46	70	97	100	126
L3	6	8	17	15	15	18
L4	28	36	51	79	82	105
L5	25	32	40	70	70	90
L6	2	3	5	4	6	7
L7	10	12	16	20	22	28
L8	66.5	80	96.5	119.5	154	175.5
L9	12.5	19	28	36	42	42
C1	70	100	130	165	215	235
C2	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P	M12×1.75P
C3	*≤14/≤16	≤19/≤24	≤32	≤35/≤38	≤42/≤48	≤55
C4	35	40.5	51	60	85	116
C5 ^{g6}	50	80	110	130	180	200
C6	8	4	5	6	6	6
C7	60	90	115	142	190	220
C8	19.5	17.5	20	22.5	29	63
C9	117	143.5	186.5	239	288	364.5
B1 ^{h9}	5	6	10	12	16	20
H1	18	24.5	35	43	59	79.5

*070ZE 5,10 减速比提供C3≤16可选。

尺寸(两级, 减速比 $i=15\sim 100$)

DIMENSIONS (DOUBLR, REDUCTION RATIO $i=15\sim 100$)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

[单位Unit: mm]

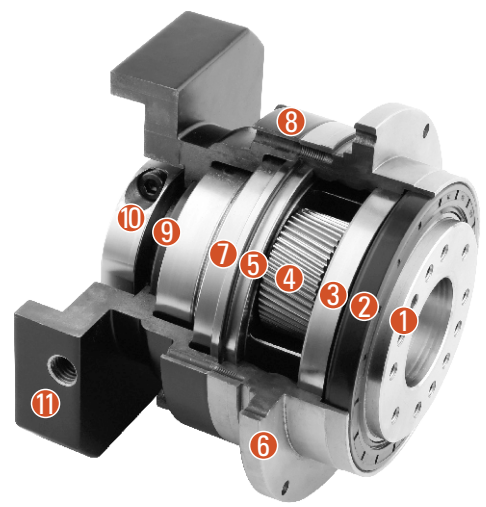
尺寸Size	090ZE	120ZE	155ZE	205ZE	235ZE
D1	80	108	140	184	210
D2	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P	M16×2P
D3 ^{h6}	22	32	40	55	75
D4 ^{g6}	68	90	120	160	180
D5	M8×1.25P	M12×1.75P	M16×2P	M20×2.5P	M20×2.5P
D6	104	130	162	205	260
D7	90	120	155	205	235
L1	31.5	36	50	-	70
L2	46	70	97	100	126
L3	8	17	15	15	18
L4	36	51	79	82	105
L5	32	40	63	70	90
L6	3	5	5	6	7
L7	12	16	20	22	28
L8	118	138	169.5	207.5	246
L9	19	28	36	42	42
C1	70	100	130	165	215
C2	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P
C3	≤14/≤15.875/≤16	≤19/≤24	≤32	≤35/≤38	≤42/≤48
C4	35	40.5	50	60	85
C5 ^{g6}	50	80	110	130	180
C6	8	4	5	6	6
C7	60	90	115	142	190
C8	19.5	17.5	12.5	22.5	29
C9	183.5	225.5	283.5	335	409
B1 ^{h9}	6	10	12	16	20
H1	24.5	35	43	59	79.5

HD系列减速机-产品规格

HD SERIES GEAR BOX - PRODUCT SPECIFICATIONS

剖视图 Sectional Drawing

- ① 输出法兰 Output shaft
- ② 油封 Oil seal
- ③ 输出轴前轴承 Output shaft front bearing
- ④ 行星轮 Planetary gear
- ⑤ 法兰内齿 Flange inner tooth
- ⑥ 输出轴后轴承 Output shaft rear bearing
- ⑦ 锁紧螺母 Lock nut
- ⑧ 后盖 Rear cover
- ⑨ 太阳轮 Solar wheel
- ⑩ 锁紧器 Locking device
- ⑪ 后盖垫片 Rear cover gasket



减速机性能资料 Reducer Performance Data

规格 Specifications		级数 Node Number	减速比 Reduction Ratio	HD064	HD090	HD110	HD140	HD200		
额定输出力矩 T_{2N}	Nm	1	4	48	130	270	560	1100		
			5	60	160	330	650	1200		
			7	50	140	300	550	1100		
			10	40	100	230	450	900		
		2	20	48	130	270	560	1100		
			25	60	160	330	650	1200		
			35	50	140	300	550	1100		
			40	48	130	270	560	1100		
			50	60	160	330	650	1200		
			70	50	140	300	550	1100		
					100	40	100	230	450	900
		急停扭矩 T_{2NOT}^2	Nm	1,2	3倍额定输出力矩					
		额定输入转速 n_{1N}	rpm	1,2	4~100	5000	4000	4000	3000	3000
		最大输入转速 n_{1B}	rpm	1,2	4~100	10000	8000	8000	6000	6000
超精密回程精度 P0	arcmin	1	4~10	-	≤1	≤1	≤1	≤1		
		2	15~100	-	-	≤3	≤3	≤3		
精密回程精度 P1	arcmin	1	4~10	≤3	≤3	≤3	≤3	≤3		
		2	15~100	≤5	≤5	≤5	≤5	≤5		
标准回程精度 P2	arcmin	1	4~10	≤5	≤5	≤5	≤5	≤5		
		2	15~100	≤7	≤7	≤7	≤7	≤7		
扭转刚性	Nm/arcmin	1,2	4~100	13	31	82	151	440		
最大弯曲力矩 M_{PKB}^3	Nm	1,2	4~100	125	235	430	1300	3064		
容许轴向力 F_{2AB}^3	N	1,2	4~100	1050	2850	2990	10590	16660		
使用寿命	hr	1,2	4~100	20000*						
效率 η	%	1	4~10	≥97%						
		2	15~100	≥94%						
重量	Kg	1	4~10	1.2	3.0	5.6	11.9	31.6		
			15~100	1.6	3.7	7.3	15.9	36.9		
		2	15~100	1.4	3.5	6.5	15.5	34.5		
使用温度	°C	1,2	4~100	-10°C~+90°C						
润滑		1,2	4~100	合成润滑油脂 (NYOGEL 792D)						
防护等级		1,2	4~100	IP65						
安装方向		1,2	4~100	任意方向						
噪音值 距离1m ($n_1=3000\text{rpm}$, 无负载)	dB(A)	1,2	4~100	≤58	≤60	≤63	≤65	≤67		

减速机转动惯量 Moment Of Inertia Of The Reducer

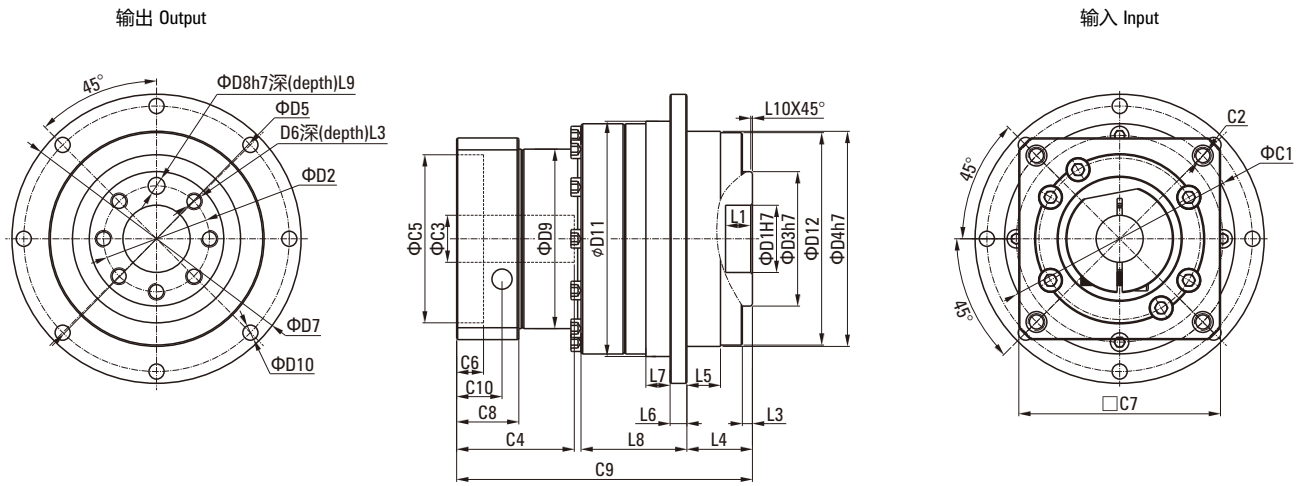
规格 Specifications		级数 Node Number	减速比 Reduction Ratio	HD064	HD090	HD110	HD140	HD200		
转动惯量 J_1	Kg·cm ²	1	4	0.14	0.51	2.87	7.54	25.03		
			5	0.13	0.47	2.71	7.42	23.29		
			7	0.13	0.45	2.62	7.14	22.48		
			10	0.13	0.44	2.57	7.03	22.51		
		2	20	0.03	0.13	0.47	2.71	7.42		
			25	0.03	0.13	0.47	2.71	7.42		
			35	0.03	0.13	0.47	2.71	7.42		
			40	0.03	0.13	0.44	2.57	7.03		
			50	0.03	0.13	0.44	2.57	7.03		
			70	0.03	0.13	0.44	2.57	7.03		
					100	0.03	0.13	0.44	2.57	7.03

1. 减速比 $i = N_1 / N_{out}$ 2. 最大加速力矩 $T_{2B} = 60\%$ of T_{2N} 3. 输出转速100rpm时, 作用于输出轴中心位置。
 *连续运转, 使用寿命为10000hrs

尺寸(单级, 减速比 i=4~10)

DIMENSIONS (SINGLE SEGMENT, REDUCTION RATIO i=4~10)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

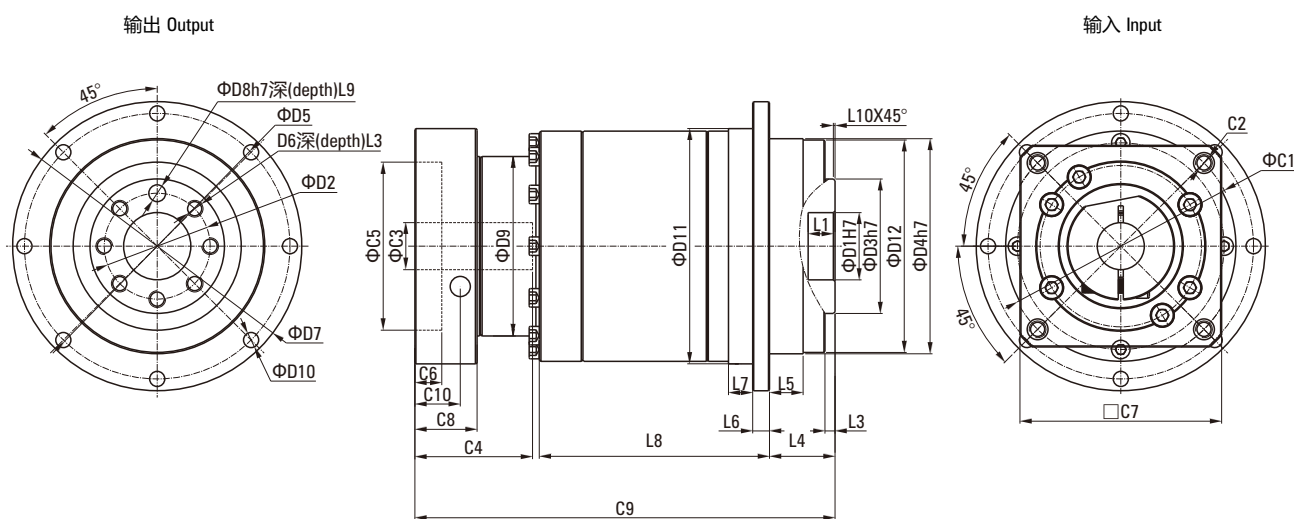
[单位Unit: mm]

尺寸Size	HD064	HD090	HD110	HD140	HD200
D1 _{h7}	20	31.5	40	50	80
D2	31.5	50	63	80	125
D3 _{h7}	40	63	80	100	160
D4 _{h7}	64	90	110	140	200
D5	79	109	135	168	233
D6	7×M5×0.8P	7×M6×1P	11×M6×1P	11×M8×1.25P	11×M10×1.5P
D7	86	118	145	179	247
D8 _{h7}	5	6	6	8	10
D9	55	77	90	113	138
D10	8×4.5	8×5.5	8×5.5	12×6.6	12×9
D11 _{h7}	70	95	120	152	212
D12	63.2	89.2	109.2	139.2	199.2
L1	8	12	12	12	16
L2	8	13.5	13.5	17	22.5
L3	3	6	6	9	8
L4	19.5	30	29	38	50
L5	7	10	10	14.6	15
L6	4	7	8	10	12
L7	7.7	8	10	12	15
L8	28.5	27	37	62	69.5
L9	6	7	7	7	10
L10	0.5	1	1	1	1
C1 [†]	70	100	130	165	215
C2 [†]	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P	M12×1.75P
C3 [†]	*≤14/≤16	≤19/≤24	≤32	≤38	≤48
C4 [†]	34	40	50	60	85
C5 [†] ₀₆	50	80	110	130	180
C6 [†]	8	4	5	9	6
C7 [†]	60	90	115	142	190
C8 [†]	19	17	19.5	22.5	29
C9 [†]	82.5	99.5	121.5	151	199.5
C10 [†]	13.5	10.75	13	15	20.75
OD	66×2	90×3	110×3	145×3	200×5

*HD060 5, 10 减速比提供C3≤16可选。

尺寸(两级, 减速比 $i=20\sim100$) DIMENSIONS (DOUBLE, REDUCTION RATIO $i=20\sim100$)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

[单位Unit: mm]

尺寸Size	HD064	HD090	HD110	HD140	HD200
D1 _{h7}	20	31.5	40	50	80
D2	31.5	50	63	80	125
D3 _{h7}	40	63	80	100	160
D4 _{h7}	64	90	110	140	200
D5	79	109	135	168	233
D6	7×M5×0.8P	7×M6×1P	11×M6×1P	11×M8×1.25P	11×M10×1.5P
D7	86	118	145	179	247
D8 _{h7}	5	6	6	8	10
D9	45.5	53.4	77	102	125
D10	8×4.5	8×5.5	8×5.5	12×6.6	12×9
D11 _{h7}	70	95	120	152	212
D12	63.2	89.2	109.2	139.2	199.2
L1	8	12	12	12	16
L2	8	13.5	13.5	17	22.5
L3	3	6	6	6	8
L4	19.5	30	29	38	50
L5	7	10	10	14.6	15
L6	4	7	8	10	12
L7	7.7	8	10	12	15
L8	65	60	87.5	110	132.5
L9	6	7	7	7	10
L10	0.5	1	1	1	1
C1 ⁵	46	70	100	130	165
C2 ⁵	M4×0.7P	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P
C3 ⁵	*≤11/≤12	≤14/≤15.875/≤16	≤19/≤24	≤32	≤38
C4 ⁵	30	34	40	50	60
C5 ⁵ _{GS}	30	50	80	110	130
C6 ⁵	3.5	8	4	5	6
C7 ⁵	48	60	90	115	142
C8 ⁵	19.5	19	17	19.5	22.5
C9 ⁵	108	134	160	204	248
C10 ⁵	13.25	13.5	10.75	13	15
OD	66×2	90×3	110×3	145×3	200×5

*HD060 5,10 减速比提供C3≤16可选。

■ 安装马达的步骤 Assembly Procedure

客户自行安装伺服马达时，请按以下要领进行安装。伺服马达的尺寸多种多样，除指定的产品外，有些马达可能会无法连接法兰，因为，一定要使用您订货时指定的马达。

If a customer personally assembles the servo motor and reducer please use the following tip. The reducer flange to which the servo motor is attached has different dimensions based on the motor specified. Therefore, assembly may be impossible for some motor. Make sure the correct motor is specified before ordering the reducer.

1. 安装无键马达 Spec. In Case Of Assembling A Motor Without Key

- ① 拧去紧定螺钉，转动输入轴，使螺栓头和紧定螺钉的孔吻合。并确认固定螺栓已松开。
Take off the rubber cap, turn the input shaft, and match the head of the bolt to the hole of the rubber cap. Make sure that the set bolt is loosened.
- ② 将马达轴平稳地插入输出轴（请确保不受阻塞地顺畅的插入）。请充分注意不要让马达倾斜插入。
Gradually put the motor shaft into the input shaft (Ensure that it is smoothly put in without iam.) Be careful not to be inserted with the motor tilted.
- ③ 将马达固定在减速机上，并按指定的扭矩将螺栓拧紧。（参考表1）
Attach the motor to the reducer and fasten the bolt with designated fastening torque. (See table 1)
- ④ 使用扭矩扳手等工具，按指定的扭矩将输入轴的固定螺栓拧紧。（参考表2）
Fasten the set bolt of the input shaft with designated fastening torque wrench, etc. (See table 2)
- ⑤ 拧上紧定螺钉。安装到此结束。
Put on a rubber cap. It is the end of assembling.

● 表1 Table1

马达固定螺栓 Motor Combination Bolt	拧紧扭矩 Fastening Torque	
	(N·m)	(kgf·cm)
M3	1.0	10
M4	3.0	30
M5	5.8	60
M6	9.8	100
M8	19.6	200
M10	39.2	400
M12	68.6	700
M16	168	1650

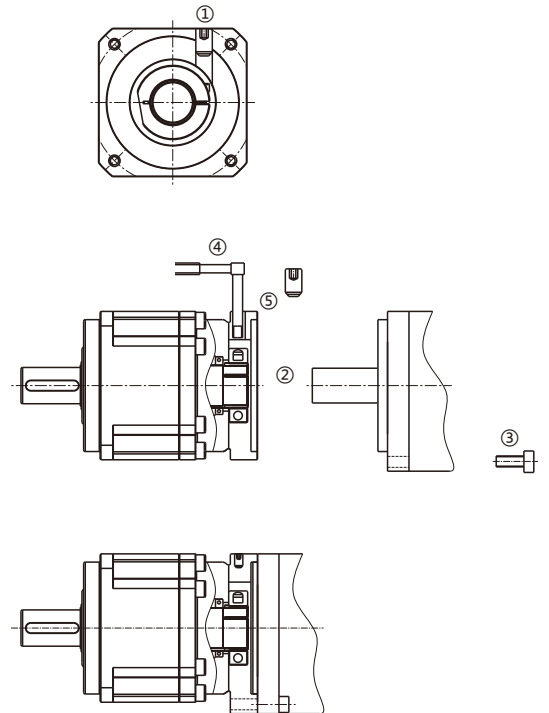
● 表2 Table2

固定螺栓 Combination Bolt	拧紧扭矩 Fastening Torque	
	(N·m)	(kgf·cm)
M3	1.5	15
M4	3.5	35
M5	7.1	71
M6	12	120
M8	30	300
M10	60	612

带键槽式马达的键取下后，可以像上述无键马达一样安装。无需担心会滑动。

You can assemble the motor with keyway like above when take off the key. There is no risk of dislocation.

● ZB/ZE系列示意图
ZB/ZE Series Schematic Diagram



■ 减速机的安装 Reducer Assembly

将减速机安装在设备上时，请在确认安装面平坦且无毛刺等后，使用扭矩扳手等工具按指定的扭矩用螺栓将其固定。(参考表3)

Joining with reducer In case of joining a reducer with the device, make sure that the combining side is plane without inconsistency, and when assemble reducer onto equipment, ensuring assembly surface smooth and without burr. (See table 3)

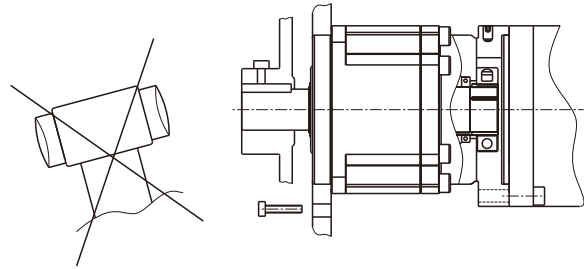
● 表3 Table 3

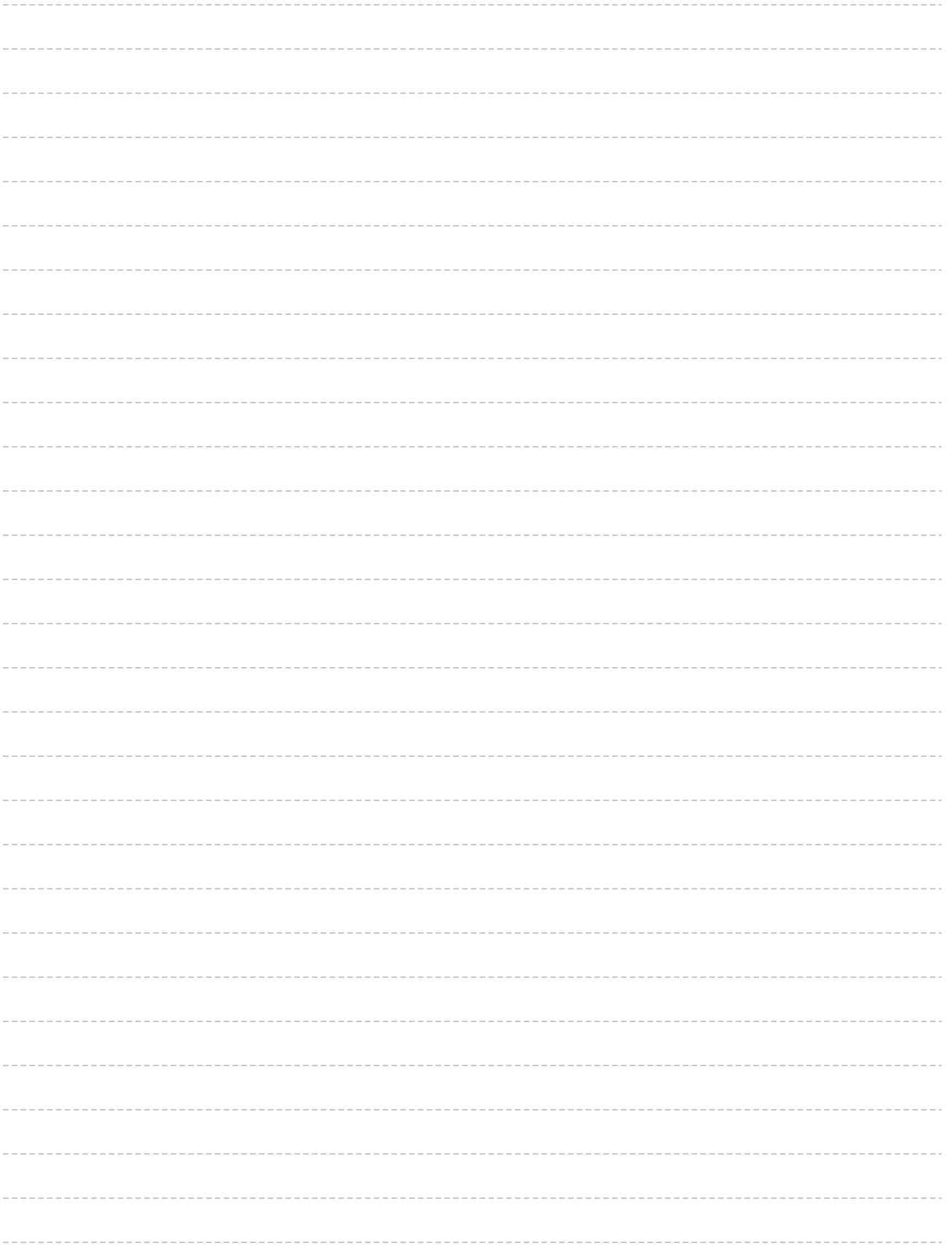
减速机固定螺栓 Reducer Combination Bolt	拧紧扭矩 Fastening Torque	
	(N·m)	(kgf·cm)
M5	5.80	60
M6	9.80	100
M8	19.6	200
M10	39.2	400
M12	68.6	700
M16	16.8	1650

■ 连接输出轴 Connection To The Output Shaft

注意事项 Cautions:

- 在输出轴上安装耦合器、滑轮等时，请勿在输出轴上施加过大的轴向负荷。
When assemble a coupling, pulley, etc. onto the output shaft, make sure that excessive axial load not be given to the output shaft.
- 请勿使用强力将轴敲入，以免使轴承或减速机内部受到损伤。
In case of strongly hitting the shaft with a hammer, the shaft inlet or the inside of the reducer may be damaged, therefore it shall be prohibited.
- 安装的耦合器等的轴和键槽如有较大松动，可能会导致设备烧毁，安装时请充分注意。
If the shaft or key of a coupling assembled is loosed, it may cause carbonization, so be careful when assembling.
- 安装耦合器等时，请使用固定螺栓来将键固定住。
For assembling of a coupling, fix the key with a set bolt.
- 连接时请充分调校轴心。
Please adjust shaft centre carefully in connecting.





CATALOGUE



TRANSMISSION PLANETARY
传动行星减速电动机

ZD 中大力德



PLANETARY GEAR BOX
ZDE/ZDF(S)系列
高精度行星减速机

ZD 中大力德



PLANETARY GEAR BOX
ZDR/ZDGF(S)系列
高精度行星减速机

ZD 中大力德



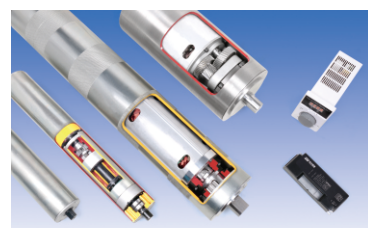
PLANETARY GEAR BOX
ZB/ZBR/ZE/HD系列
高精度行星减速机

ZD 中大力德



**CYCLOIDAL PIN WHEEL
PRECISION REDUCER**
摆线针轮精密减速器

ZD 中大力德



DRUM MOTOR
电动滚筒减速机

ZD 中大力德

PLANETARY GEAR BOX CATALOGUE

宁波中大力德智能传动股份有限公司
NINGBO ZHONGDA LEADER INTELLIGENT TRANSMISSION CO.,LTD.

地址：浙江省慈溪高新技术产业开发区新兴一路185号
Add : NO.185 1st Xinxing Road, New Industrial Zone, Cixi City, Zhejiang, China.

宁波中大创远精密传动设备有限公司
ZHONGDA CHUANGYUAN PRECISE TRANSMISSION EQUIPMENT CO.,LTD.

地址：浙江省宁波杭州湾新区金慈路159号
Add : No.159 Jinci Road, Hangzhou Bay District, Ningbo, Zhejiang, China.

国内贸易服务：

电话：0574-63537377
传真：0574-63534879
E-mail: china@zd-motor.com

国际贸易服务：

International trade department:
Tel: 86-574-63530538 Fax: 86-574-63534879
E-mail: manager@zd-motor.com
E-mail: trade@zd-motor.com

更多详情，敬请浏览：



www.zd-motor.com