



**ZPG/ZRS/AGV系列
高精度行星减速机
PLANETARY GEAR BOX**



Zhongda Realizes the infinite possibility in automation application

宁波中大力德智能传动股份有限公司始创于1998年，是一家集电机驱动、微特电机、精密减速器、机器人结构本体及一体化智能执行单元的研发、制造、销售、服务于一体的国家高新技术企业。公司注册资本15117万元，分、子公司9家，员工1800余人，2017年8月在深交所主板上市，股票代码：002896。

公司系国家级高新技术企业，主导和参与起草国家标准12项，行业标准5项；授权专利107项，其中发明专利14项。拥有机械工业精密齿轮减速电机工程研究中心、浙江省级高新技术企业研究开发中心、浙江省级企业技术中心。

公司立足于智能化、自动化装备核心零部件设计和制造，为客户提供智能驱动解决方案。公司产品以其差异化和高性价比优势，广泛应用于工作母机、数控设备、工业机器人、智能物流、新能源、食品、包装、纺织、电子、医疗、通讯、农牧等机械装备领域。在替代进口产品的基础上，逐步参与国际竞争。

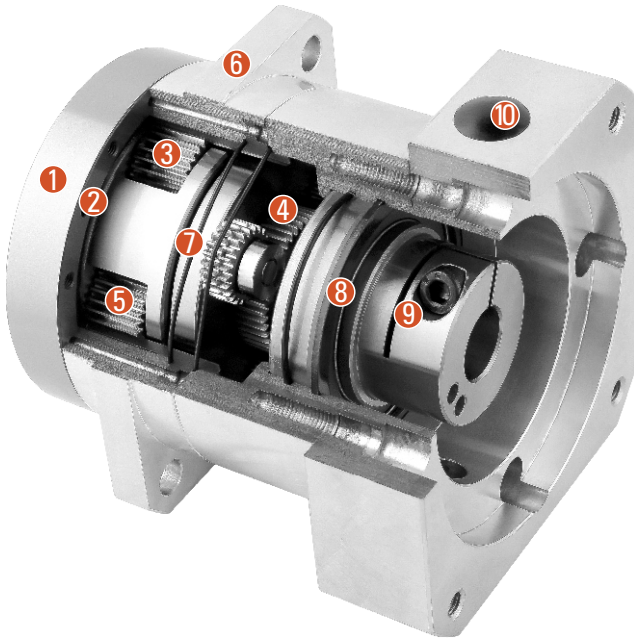
Ningbo Zhongda Leader Intelligent Transmission Co., Ltd. was founded in 1998. It is an electromechanical automation enterprise integrating R&D, manufacturing, sales and service of motor drives, micro motors, precision reducers and integrated products. It has 9 branches and subsidiaries, over 1,800 employees, and a registered capital of 151.17 million yuan. In August 2017, it was listed on the A-shares of the Shenzhen Stock Exchange (stock code 002896).

The company is a national-level high-tech enterprise, leading and participating in the drafting of 10 national standards and 5 industry standards, maintaining 107 patents and 11 invention patents. It's owning a Zhejiang-level enterprise R&D center.

The company is based on intelligent and automation equipment core component manufacturers and design solution providers. With its differentiated and cost-effective advantages, the company's products are widely used in industrial robots, intelligent logistics, new energy, machine tools and other fields, as well as special machinery and equipment for food, packaging, textiles, electronics, and medical treatment. On the basis of realizing domestic substitution of imported products, gradually participate in international competition.

ZPG系列减速机 ZPG SERIES GEAR BOX

剖视图 Sectional Drawing



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

系列号、机座标识说明 Type And Model Number

ZPG减速机 ZPG Reducers	伺服电机 Servo Motor
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32
①
ZPG
②
21
③
()
④
(S)
⑤
-
1000
⑥
T1
⑦

① 减速机机座号: 20, 32, 50	Gear head frame size: 20, 32, 50
② 减速机系列代号: ZPG: 高转矩型	Gear head series code: ZPG: The high torque type
③ 减速比	Gear ratio
单级: 5	Single stage: 5
两级: 11, 15, 21, 33, 45	Two stages: 11, 15, 21, 33, 45

④ 精度
输出轴负荷量为容许输出扭矩的±3%时的值
Backlash
Output load is ±3% of the rated output torque

机座号 Reducer Type No	级数 Stage	标准型 (省略) Standard Type	高精密型PO Standard Type
20ZPG	1	3分arc-min	1分arc-min
	2	5分arc-min	3分arc-min
32ZPG	1	3分arc-min	1分arc-min
	2	5分arc-min	3分arc-min
50ZPG	1	3分arc-min	1分arc-min
	2	5分arc-min	3分arc-min

输入轴型式	Input shaft type
S: 整体锁紧 (省略) (无论马达是否有键槽都可使用)	S: Overall Locking (Omission)(Regardless whether the motor with keyway can use it)
⑤ S1: 带锁紧环锁紧 (省略) (无论马达是否有键槽都可使用)	S1: Locking with locking ring (Omission)(Regardless whether the motor with keyway can use it)
S2: 带键槽锁紧 (输入轴带键)	S2: Locking with keyway (Input shaft with key)
A: 其他适配器 (请与本公司联系)	A: Other type (Please contact with us)
⑥ 适用伺服马达功率 (W)	Applicable servo motor power (W)
⑦ 输入法兰与伺服电机对应尺寸表	Model of servo motor

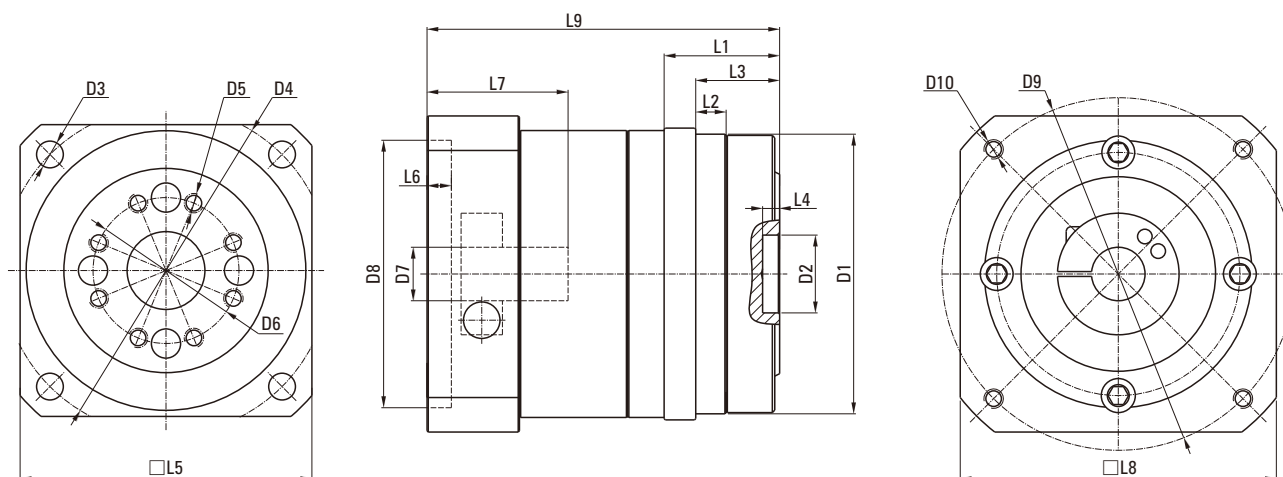
产品规格 PRODUCT SPECIFICATIONS

■ 减速机性能资料 Reducer Performance Data

规格 Specifications		级数 Stage Number	减速比 Reduction Ratio	20ZPG	32ZPG	50ZPG
额定输出力矩 T_{20} Rated output torque	Nm	1	5	50	150	380
			2	11	59	160
		15		70	220	460
		21		78	240	490
		33		72	200	620
		45	98	280	640	
瞬间最大扭矩 Instantaneous maximum torque	Nm	1,2		2倍额定输出力矩 2 times rated output torque		
推荐输入转速 Recommended input speed	rpm	1,2	5~45	3000	3000	2000
最大输入转速 Maximum input speed	rpm	1,2	5~45	6000	6000	4500
精密背隙 Precision back lash	arcmin	1,2	5~45	≤1	≤1	≤1
标准背隙 Standard back lash	arcmin	1,2	5~45	≤3	≤3	≤3
扭转刚性 Torsional rigidity	Nm/arcmin	1,2	5~45	0.55	2.2	14
使用寿命 Life	hr	1,2	5~45	20000		
效率 Efficiency	%	1	5	≥97		
		2	11~45	≥94		
重量 Weight	Kg	1	5	1.2	3.0	10
		2	11~45	1.5	3.7	12
使用温度 Ambient temperature	°C	1,2	11~45	-10°C~+90°C		
润滑 lubrication		1,2	11~45	终身润滑 Lifetime lubrication		
防护等级 Protection grade		1,2	11~45	IP65		
安装方向 Installation direction		1,2	11~45	任意方向 Any direction		
噪音值 Noise value	dB (A)	1,2	11~45	≤63	≤65	≤72
转动惯量 The moment of inertia	Nm	1	5	0.16	0.80	4.90
			2	11	0.17	1.00
		15		0.15	0.74	3.50
		21		0.071	0.35	1.60
		33		0.029	0.17	0.72
		45	0.022	0.12	0.50	

ZPG尺寸 (一级, 减速比*i* = 5, 二级, 减速比*i* = 11~45) ZPG DIMENSIONS (SINGLE STAGE, RATIO *i* = 5, TWO STAGE *i* = 11-45)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

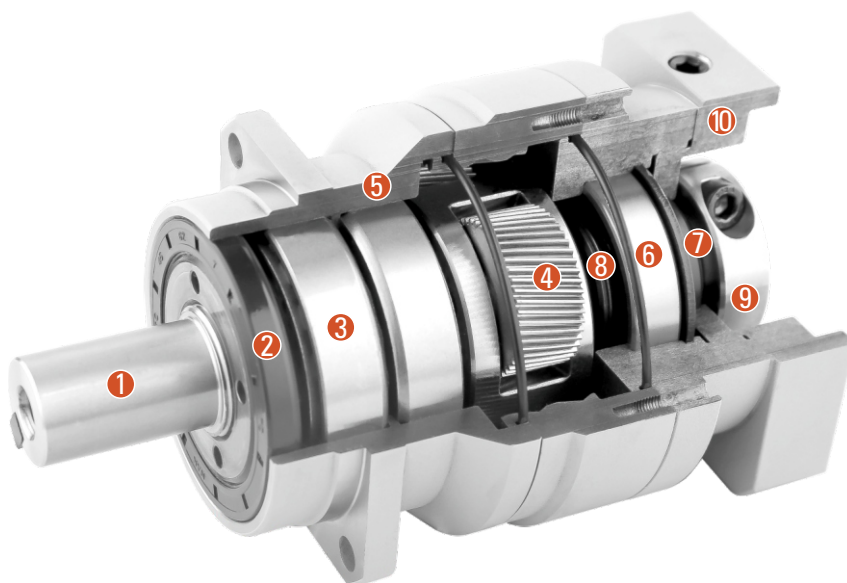
单位 Unit: mm

产品型号 Type	20ZPG	32ZPG	50ZPG
D1安装凸台 D1 Mounting boss	Φ85h7	Φ115h7	Φ165h7
D2安装止口 D2 Install the check	Φ24H7	Φ32H7	Φ47H7
D3法兰安装通孔 D3 flange mounting through hole	4-Φ9	4-Φ11	4-Φ14
D4安装通孔分布圆 D4 Installation through holes are circular	Φ105	Φ135	Φ190
D5螺纹安装孔 D5 Threaded mounting holes	8-M6×10	8-M8×12	8-M12×20
D6螺纹孔分布圆 D6 Threaded holes are distributed round	Φ45	Φ60	Φ90
D7输入联轴器孔 D7 Input coupling hole	Φ14~Φ19	Φ22	Φ35
D8输入止口 D8 Input lip	Φ70	Φ110	Φ114.3
D9输螺纹孔分布圆 D9 Distribution circle of threaded hole	Φ90	Φ145	Φ200
4-D10垫片螺纹孔 4-D10 Gasket threaded hole	M6×10	M8×12	M12×20
L1法兰面到端面长度 L1 Flange face to face length	37	47.5	69
L2凸台长度 L2 Boss length	8	12.5	12
L3输出法兰厚度 L3 Output flange thickness	10	13	16
L4止口深度 Depth of L4 stop	5	6.5	7
L5法兰宽度 L5 Flange width	□90	□120	□170
L6垫片止口深度 L6 Gasket rabbet depth	5	8	10
L7联轴器深度 L7 Coupling depth	41	58	81
L8垫片宽度 L8 Gasket width	100	130	176
L9减速器长度 L9 Reducer length	113	145	213

ZRS系列减速机

ZRS SERIES GEAR BOX

剖视图 Sectional Drawing



- ① 输出轴 Output shaft
- ② 油封 Oil seal
- ③ 输出轴轴承 Output shaft bearing
- ④ 行星轮 Planetary gear
- ⑤ 前盖 Front cover
- ⑥ 联轴器轴承 Coupling bearing
- ⑦ 油封 Oil seal
- ⑧ 联轴器 Coupling
- ⑨ 锁紧环 Lock ring
- ⑩ 后盖 Rear cover

系列号、机座标识说明 Type And Model Number

ZRS减速机 ZRS Reducers	伺服电机 Servo Motor
060 ①	T1 ⑦
ZRS ②	(S) ⑤
10 ③	() ④
-	400 ⑥
① 减速机机座号: 060 Gear head frame size: 060 ② 减速机系列代号: ZRS: 方形安装法兰系列 Gear head series code: ZRS: Square mounting flange series 减速比 Gear ratio ③ 单级: 3, 4, 5, 6, 7, 8, 9, 10 Single stage: 3, 4, 5, 6, 7, 8, 9, 10 两级: 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 Single stage: 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 精度 具体见P07 Amount of backlash, (P07) ④ 标准型P1(省略) 高精密型P0 Standard type P1 (Omission), high precision P0 输出轴负荷量为容许输出扭矩的±3%时的值 Precision (The load of output shaft is ±3% of allowable output torque) 输入轴型式 Input shaft type S: 整体锁紧(省略)(无论马达是否有键槽都可使用) S: Overall Locking (Omission)(Regardless whether the motor with keyway can use it) ⑤ S1: 带锁紧环锁紧(省略)(无论马达是否有键槽都可使用) S1: Locking with locking ring (Omission)(Regardless whether the motor with keyway can use it) S2: 带键槽锁紧(输入轴带键) S2: Locking with keyway (Input shaft with key) A: 其他适配器(请与本公司联系) A: Other type (Please contact with us) ⑥ 适用伺服马达功率(W) Applicable servo motor power (W) ⑦ 输入法兰与伺服电机对应尺寸表 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 Stage Number	减速比 Reduction Ratio	060ZRS	075ZRS	100ZRS	140ZRS	
额定输出转矩 T_{2N} Rated output torque	Nm	1	3	55	130	208	342	
			4	50	140	190	542	
			5	60	160	330	650	
			6	55	150	310	600	
			7	50	140	300	550	
			8	45	120	260	500	
			9	40	100	230	450	
			10	40	100	230	450	
			2	15	-	130	208	342
				20	-	140	290	542
		25		-	160	330	650	
		30		-	150	310	600	
		35		-	140	300	550	
		40		-	120	260	500	
		45		-	100	230	450	
		50		-	160	330	650	
		60		-	150	310	600	
		70	-	140	300	550		
		80	-	120	260	500		
90	-	100	230	450				
100	-	100	230	450				
急停扭矩 Scram torque	Nm	1,2	3~100	3倍额定输出转矩 3 times rated output torque				
额定输入转速 Rated input speed	rpm	1,2	3~100	3000	3000	3000	2000	
最大输入转速 Maximum input speed	rpm	1,2	3~100	6000	6000	6000	4000	
精密背隙 Precision back lash	arcmin	1	3~10	≤1	≤1	≤1	≤1	
		2	15~100	-	≤3	≤3	≤3	
标准背隙 Standard back lash	arcmin	1	3~10	≤3	≤3	≤3	≤3	
		2	15~100	-	≤5	≤5	≤5	
扭转刚性 Torsional rigidity	Nm/arcmin	1,2	3~100	7	14	25	50	
容许径向力 Allowable radial force	N	1,2	3~100	3000	4300	7000	10000	
容许轴向力 Allowable axial force	N	1,2	3~100	2700	3900	6300	9000	
使用寿命 Life	hr	1,2	3~100	20000				
效率 Efficiency	%	1	3~10	≥97				
		2	15~100	≥94				
重量 Weight	Kg	1	3~10	1.3	3.7	7.8	14.5	
		2	15~100	-	4.1	9	17.5	
工作温度 Working temperature	°C	-	-	-10°C~+90°C				
润滑方式 Lubrication way	-	-	-	合成润滑脂 Synthetic grease				
防护等级 Protection grade	-	-	-	IP65				
安装方向 Installation direction	-	1,2	3~100	任意方向 Any direction				
噪音值 Noise value	dB (A)	1,2	3~100	≤58	≤60	≤63	≤67	

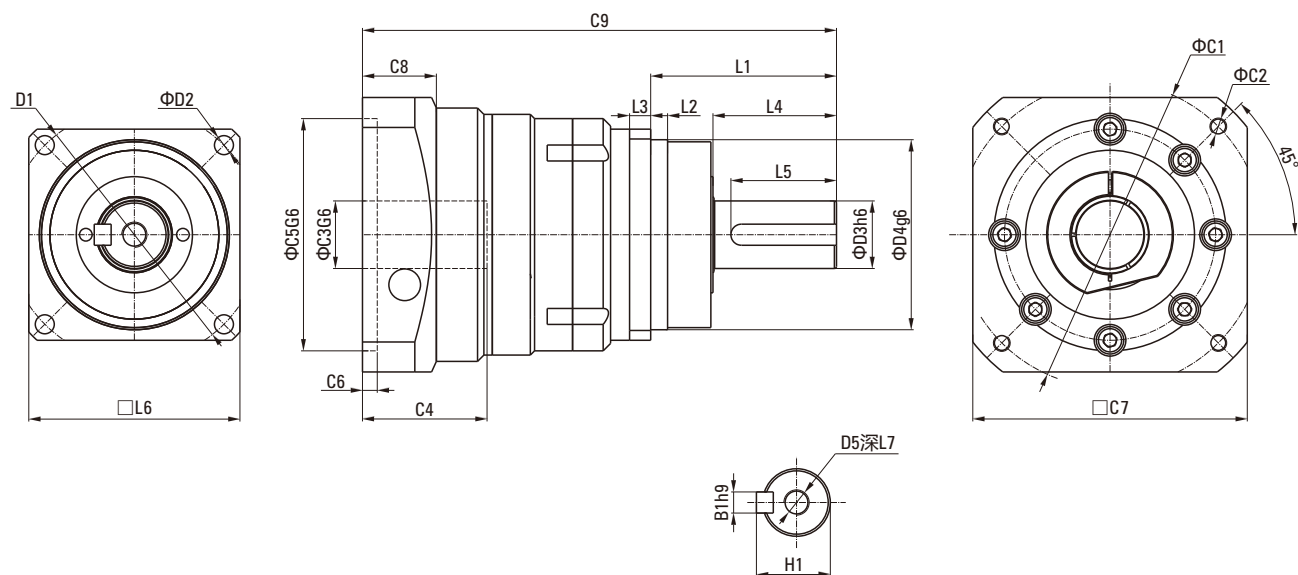
减速机转动惯量 Moment Of Inertia Of The Reducer

规格 Specifications		级数 Stage Number	减速比 Reduction Ratio	060ZRS	075ZRS	100ZRS	140ZRS	
转动惯量 J_1 The moment of inertia	Kg·cm ²	1	3	0.22	1.20	5.2	20	
			4	0.17	0.95	4.0	15	
			5	0.16	0.86	3.6	13	
			6	0.15	0.82	3.3	13	
			7	0.14	0.79	3.1	12	
			8	0.14	0.77	3.0	12	
			9	0.14	0.76	3.0	11	
			10	0.14	0.75	3.0	11	
			2	15	-	0.72	2.8	11
				20	-	0.72	2.8	11
		25		-	0.71	2.8	11	
		30		-	0.70	2.7	10	
		35		-	0.71	2.7	11	
		40		-	0.69	2.7	10	
		45		-	0.71	2.7	11	
		50		-	0.69	2.7	10	
		60		-	0.69	2.7	10	
		70		-	0.69	2.7	10	
		80	-	0.69	2.7	10		
		90	-	0.69	2.7	10		
100	-	0.69	2.7	10				

ZRS尺寸 (一级, 减速比 $i=3\sim 10$)

ZRS DIMENSIONS (SINGLE STAGE $i=3\sim 10$)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

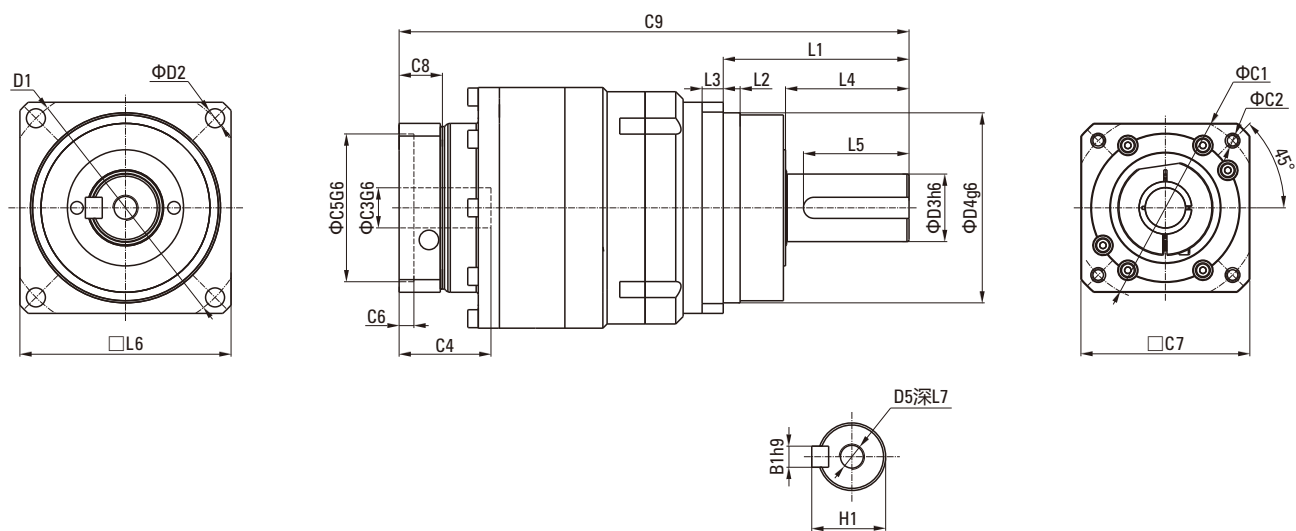
单位 Unit: mm

尺寸Size	060ZRS	075ZRS	100ZRS	140ZRS
D1	68	85	120	165
D2	5.5	7.5	9	11
D3 _{h6}	16	22	32	40
D4 _{g6}	60	70	90	130
D5	M5×0.8P	M8×1.25P	M12×1.75P	M16×2P
L1	48	56	88	112
L2	11	6	8	10
L3	6	7	10	12
L4	28	34.7	58	82
L5	25	31	50	70
L6	60	75	100	140
L7	15	19	28	36
C1	70	100	145	165
C2	M5×0.8P	M6×1P	M8×1.25P	M10×1.5P
C3 _{g6}	≤14/≤16	≤19/≤24	≤32	≤38
C4	35	40.5	51	60
C5 _{g6}	50	80	110	130
C6	8	4	5	6
C7	60	90	130	142
C8	19.5	17.5	20	22.5
C9	96.5	167.5	224.5	295.5
B1 _{h9}	5	6	10	12
H1	18	24.5	35	43

ZRS尺寸 (二级, 减速比 $i=15\sim100$)

ZRS DIMENSIONS (TWO STAGE $i=15\sim100$)

尺寸图 Dimensional Drawing



尺寸表 Dimensional Table

单位 Unit: mm

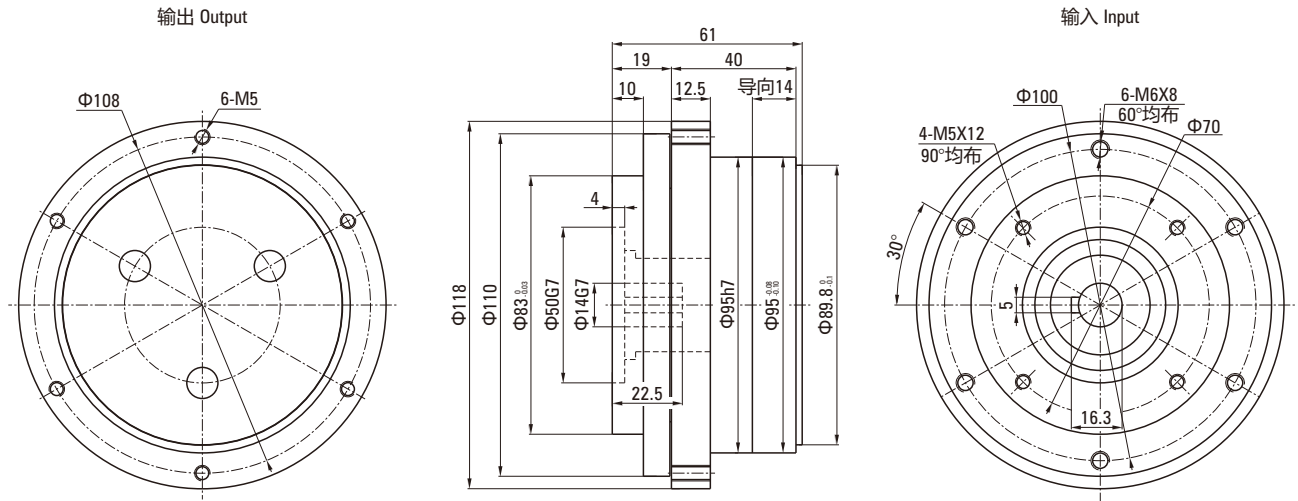
尺寸Size	075ZRS	100ZRS	140ZRS
D1	85	120	165
D2	7.5	9	11
D3 ^{h6}	22	32	40
D4 ^{g6}	70	90	130
D5	M8×1.25P	M12×1.75P	M16×2P
L1	56	88	112
L2	6	8	10
L3	7	10	12
L4	34.7	58	82
L5	31	50	70
L6	75	100	140
L7	19	28	36
C1	70	100	145
C2	M5×0.8P	M6×1P	M8×1.25P
C3 ^{g6}	≤14/≤16	≤19/≤24	≤32
C4	35	40.5	51
C5 ^{g6}	50	80	110
C6	8	4	5
C7	60	90	130
C8	19.5	17.5	20
C9	186.5	241	308.5
B1 ^{h9}	6	10	12
H1	24.5	35	43

95AGV行星减速机-行走轮综合性能参数

95AGV DIMENSIONS-COMPREHENXIVE PERFORMANCE PARAMETERS OF TRAVELING WHEEL

尺寸图 Dimensional Drawing

● 95AGV一级行走



减速机性能资料 Reducer Performance Data

单位 Unit: mm

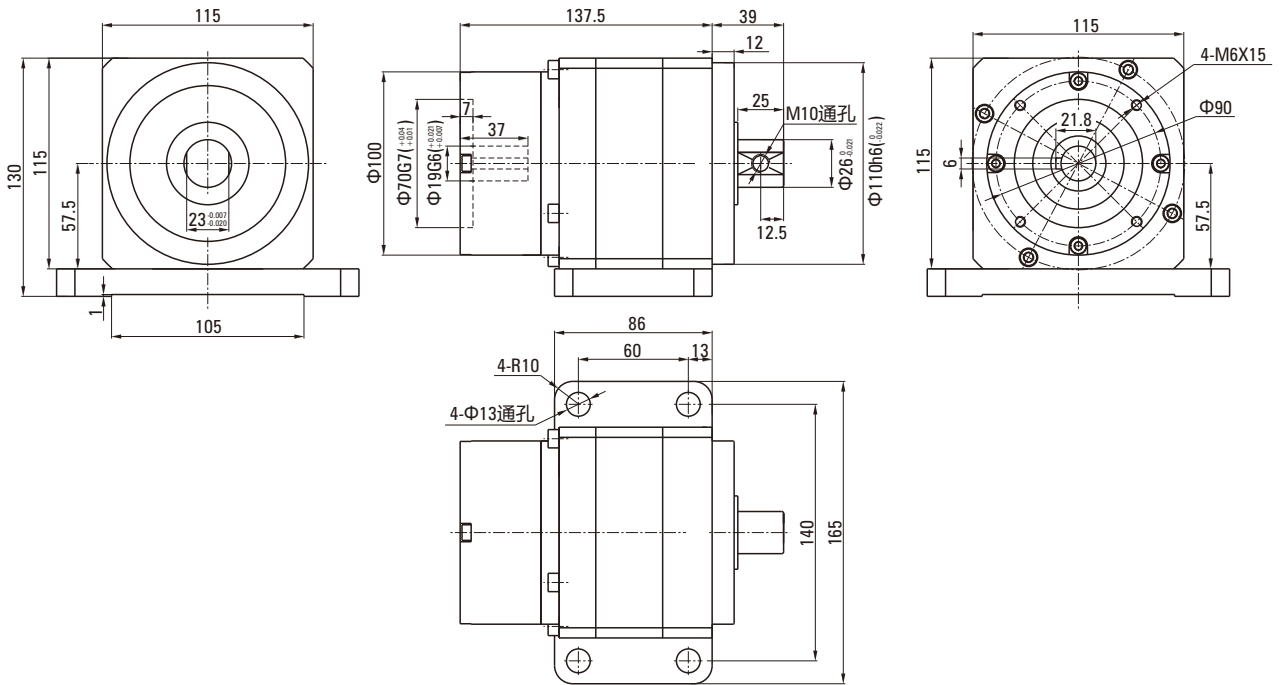
减速比 Reduction Ratio	i(推荐) Recommend	5	6	7	9
额定承载扭矩 T2N Nominal output torque	Nm	60	55	50	40
最大加速力矩 T2B Maximu acceleration torque	Nm	额定承载扭矩*1.8 Rated load-bearing torque*1.8			
急停扭矩 T2NOT Sudden stop torque	Nm	3倍于额定承载扭矩 3 time the rated load torque			
额定输入转速 Nominal input speed	rpm	3000			
最大输入转速 Maximun input speed	rpm	4500			
回程背隙 Backlash	arcmin	≤25			
容许最大径向负载 Maximum radial load	N	3000			
容许最大轴向负载 Maximum axial load	N	500			
噪音值 距离1m (n=3000 rpm, 无负载) Noise value Distance 1m (n=3000 rpm, No load)	dB(A)	≤60			
使用寿命 Service life	h	20000			
效率 Efficiency	%	95%			
使用环境温度 Use of temperature	°C	-10°C ~ +90°C			
润滑 Lubrication	-	合成润滑油脂 Synthetic grease			
重量 Weight	kg	≤3.6			
包胶轮规格 (建议) Rubber wheel specifications (Recommended)	-	150*40 (聚氨酯包胶轮可选配) Polyurethane rubber wheel optional			
级数 Stage number	-	1			

115AGV行星减速机-顶升机构综合性能参数

AGV DIMENSIONS

尺寸图 Dimensional Drawing

● 115AGV顶升



减速机性能资料 Reducer Performance Data

单位 Unit: mm

减速比 Reduction Ratio	i(推荐) Recommend	80
额定输出扭矩 T2N Nominal output torque	Nm	300
急停扭矩 T2NOT Sudden stop torque	Nm	3倍于额定承载扭矩 3 time the rated load torque
额定输入转速 Nominal input speed	rpm	3000
回程背隙 Backlash	arcmin	≤25
容许最大径向负载 Maximum radial load	N	16000
容许最大轴向负载 Maximum axial load	N	3300
噪音值 距离1m (n=3000 rpm, 无负载) Noise value Distance 1m (n=3000 rpm, No load)	dB(A)	≤65
使用寿命 Service life	h	20000
效率 Efficiency	%	92%
使用环境温度 Use of temperature	°C	-10°C ~ +90°C
润滑 Lubrication	-	合成润滑油脂 Synthetic grease
重量 Weight	kg	≤8
级数 Stage number	-	2

CATALOGUE



PLANETARY GEAR BOX
ZDR 行星减速器

ZD 中大力德



AC & DC RIGHT
ANGLE GEAR MOTOR
交、直流直角轴减速电动机

ZD 中大力德



TRANSMISSION PLANETARY
传动行星减速电动机

ZD 中大力德



PLANETARY GEAR BOX
ZB/ZBR/ZE/ZER/HD/HDR系列
高精度行星减速器

ZD 中大力德



SMALL AC GEAR MOTOR
小型交流平行轴齿轮减速电机

ZD 中大力德



DC BRUSHLESS GEAR MOTOR
微型永磁无刷齿轮减速电机

ZD 中大力德

PLANETARY GEAR BOX CATALOGUE

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