

匠心品质 坚如磐石

INGENUITY AND QUALITY ARE ROCK SOLID



精密减速机
PRECISION REDUCER

上海正桓机电设备有限公司

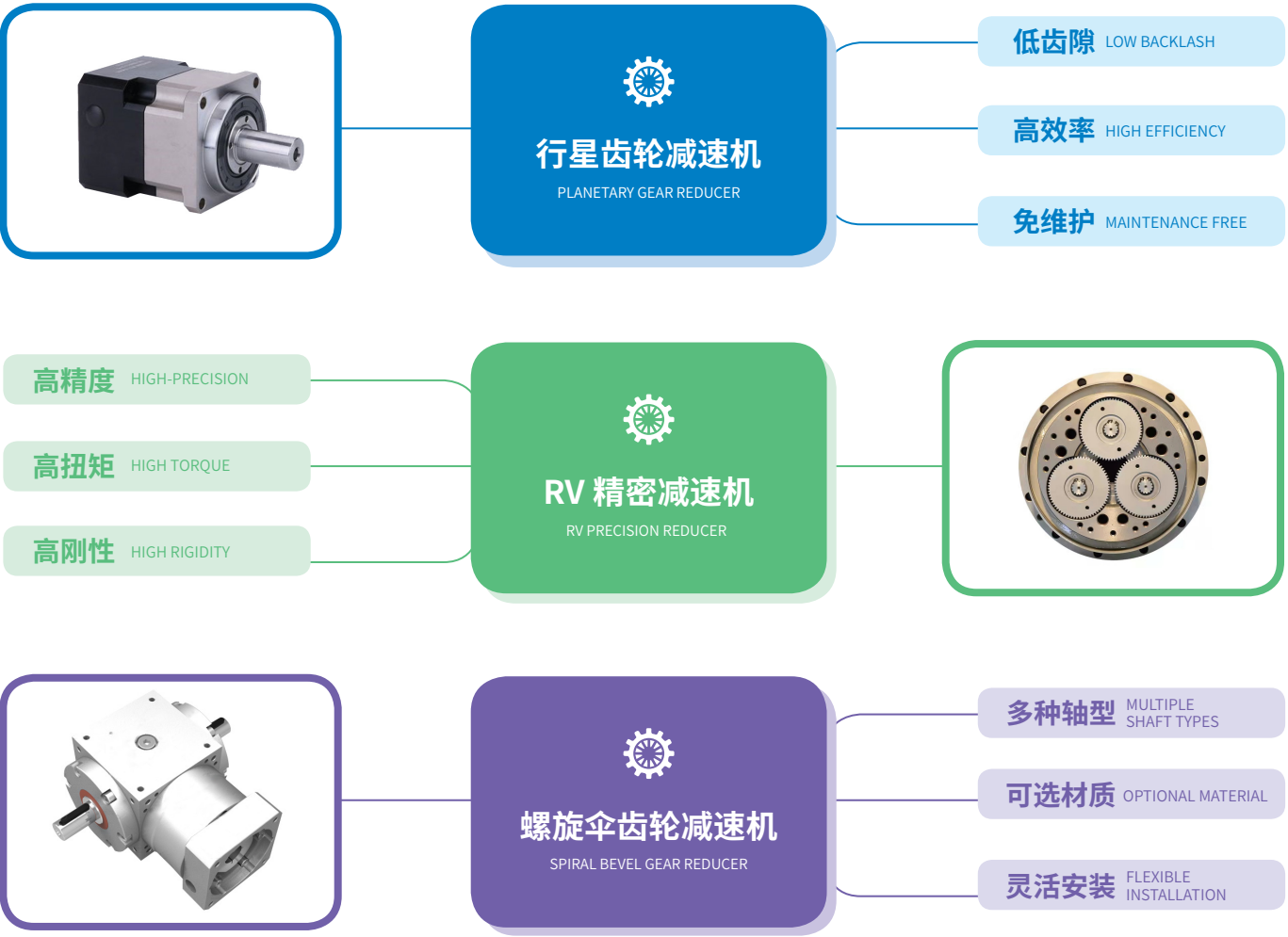
Shanghai Zhenghuan Electromechanical Equipment Co., Ltd



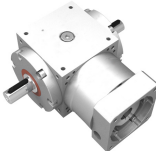
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正桓·机电

产品介绍 PRODUCT INTRODUCTION



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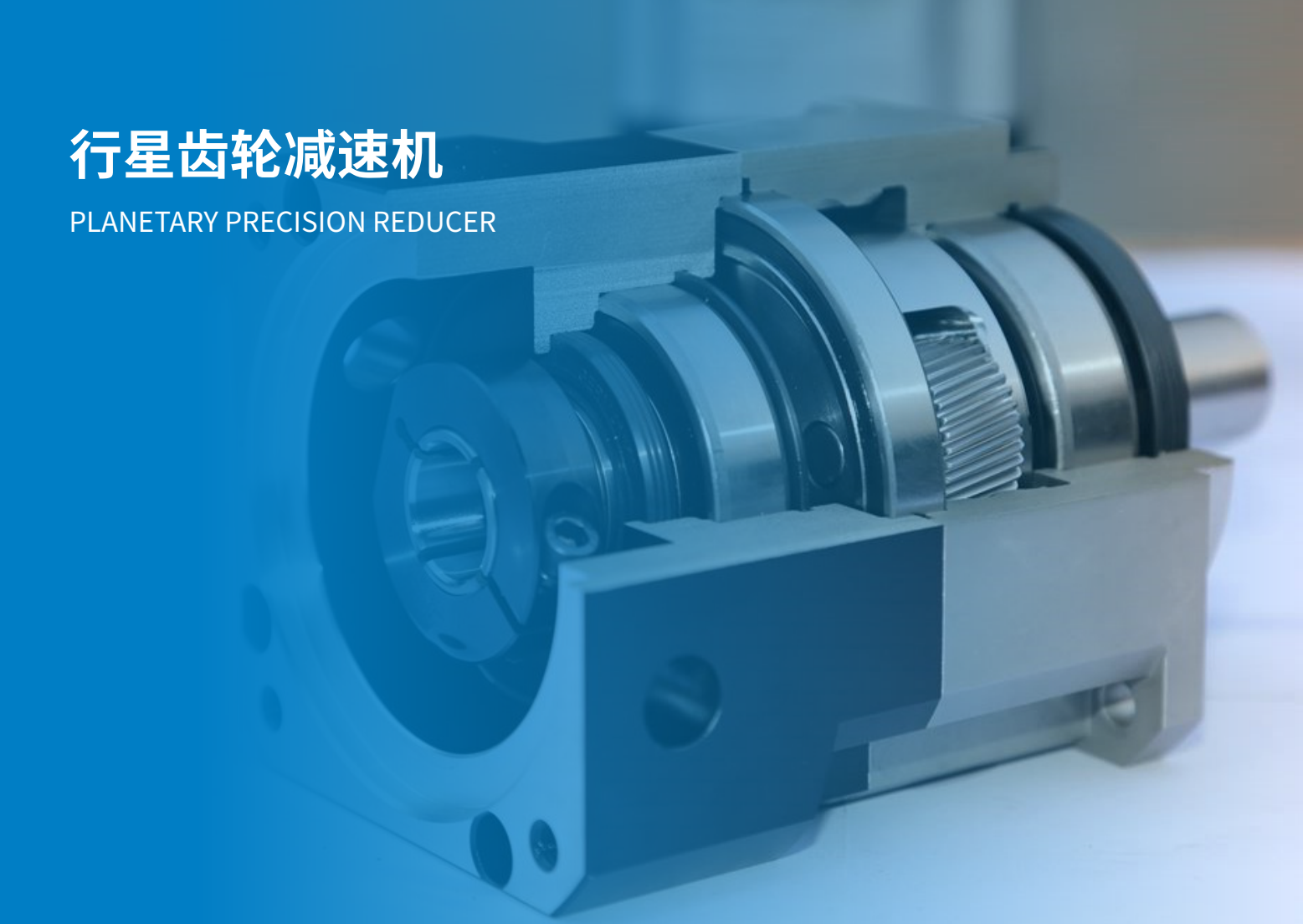
概述 SUMMARY

选型相关 SELECTION RELATED

额定输入转速 n1[rpm] Rated input speed n1 [RPM]	减速机的驱动速度，若减速机与电机直接相连，则转速值与电机转速相同。本书中的额定转入转速是在环境温度为 20° C 的条件下测得的。环境温度较高时请降低转速 n1 The driving speed of the reducer. If the reducer is directly connected with the motor, the speed value is the same as the motor speed. The rated turning speed in this book is measured at an ambient temperature of 20 ° C. When the ambient temperature is high, lower the speed valve N1
传动效率 transmission efficiency	指在额定负载情况下，减速机的传输效率。减速比越大，级数越多，效率越低。 It refers to the transmission efficiency of the reducer under rated load. The greater the reduction ratio, the more stages, and the lower the efficiency.
定位精度 positioning accuracy	在高速机械往复运动中做到精确定位的关键在于尽量减小通过运动产生的角偏差。定位精度取决于两个值，一个是与加载有关的偏转角，涉及到回程间隙和扭转刚度；另一个是运动控制有关的偏转角，涉及到同步偏差问题。 The key to accurate positioning in high-speed mechanical reciprocating motion is to minimize the angular deviation caused by motion. The positioning accuracy depends on two values: one is the deflection angle related to loading, involving return clearance and torsional stiffness; The other is the deflection angle related to motion control, which involves the problem of synchronization deviation.
回程间隙齿隙 Return clearance	减速机输出轴与输入轴的最大偏差角，测量时先将齿轮输入轴固定住，然后再输出轴用力矩仪加载一定力矩 (2%T2N), 以克服减速机内的摩擦力。 For the maximum deviation angle between the output shaft and the input shaft of the reducer, fix the gear input shaft first, and then load a certain torque (2% T2N) on the output shaft with a torque meter to overcome the friction in the reducer.
转动惯性 Inertia	本说明书中的该值均指输入端。表示一个物体尽量保持自己转动状态（或静止或转动）特征的一个值。 This value in this manual refers to the input terminal. A value indicating the characteristic that an object tries to keep its rotating state (or stationary or rotating).
额定输出扭矩 T2N[Nm] Rated output torque T2N [nm]	T2n[NM] 减速机长时间（连续工作制）可以加载的力矩（无磨损），条件应满足负载均匀，安全系数 S=1,MTA142 以下机型理论寿命为 20000 小时：MTA180 以上机型理论寿命为 10000 小时：TN 值遵守 1SODP6336 齿轮标准与 1SO281 轴承标准。 The torque (without wear) that T2N [nm] reducer can load for a long time (continuous working system) shall meet the conditions of uniform load, safety factor s = 1, theoretical life of models below MTA142 is 20000 hours; theoretical life of models above MTA180 is 10000 hours; TN value complies with 1sodp6336 gear wheel standard and 1so281 bearing standard.
加速扭矩 [Nm] Acceleration torque [nm]	指工作周期每小时少于 1000 次时允许短时间加载到输出端的最大力矩。工作周期每小时大于 1000 次时，须考虑冲击因素。加速扭矩是周期工作制选型时的一个最大值，实际使用中的加速力矩必须小于它，否则会缩短减速机的寿命。 It refers to the maximum torque allowed to be loaded to the output end in a short time when the working cycle is less than 1000 times per hour. When the working cycle is more than 1000 times per hour, the impact factor must be considered.The acceleration torque is a maximum value in the selection of periodic working system. The acceleration torque in actual use must be less than t, otherwise the service life of the reducer will be shortened.
紧急制动扭矩 [Nm] Emergency braking torque [nm]	指减速输出端所能加载的最大力矩，这个力矩可在减速机寿命期内加载 1000 次，绝对不能超过 1000 次 It refers to the maximum torque that can be loaded at the deceleration output end. This torque can be loaded 1000 times within the service life of the reducer and must not exceed 1000 times
最大输出扭矩 T2B Maximum output torque T2B	指减速机在静态条件或频繁启动条件下所能承受的输出扭矩，通常指峰值负载或启动负载。 It refers to the output torque that the reducer can bear under static conditions or frequent starting conditions, usually refers to peak load or starting load.
实际所需扭矩 T2[Nm] Actual required torque T2 [nm]	所需扭矩取决于应用场合的实际工况，拟选减速机的额定扭矩 T2N 必须大于这个扭矩。 The required torque depends on the actual working conditions of the application. The rated torque T2N of the proposed reducer must be greater than this torque.
轴向力 Fa[N] Axial force Fa [n]	是指平行于轴心的一个力，它的作用点与输出轴端有一定的轴向偏差（Y2）时，会形成一个额外的弯挠力矩。轴向力超过样本所示的额定值时，须用联轴节来抵消这种弯挠力。 It refers to a force parallel to the axis. When its action point has a certain axial deviation (Y2) from the output shaft end, an additional bending moment will be formed. When the axial force exceeds the rated value shown in the sample, the coupling must be used to offset this bending force.
径向力 Fr[N] Radial force fr [n]	指垂直作用于轴向的一个力，它平行于输出轴，它的作用点与轴端有一定的轴向距离（X2）。这个点成一个杠杆点，横向力形成一个弯挠力矩。 It refers to a force acting vertically on the uranium direction, which is parallel to the output shaft, and its action point has a certain axial distance (x2) from the shaft end. This point becomes a lever point, and the transverse force forms a bending moment.
扭转刚度 Ct21[Nm/Arcmin] Torsional stiffness ct21 [nm / arcmin]	由加载力矩和所产生的扭转角之间的比率来定义。Ct212= △ T/ △它说明需要用多大的力矩才能把输出轴转动一弧分。扭转刚度是从迟滞曲线得出的。在曲线图上只需要关注 T2B 的 50% 到 100% 这个范围，在这个范围内，曲线可看成是一条直线。 It is defined by the ratio between the loading moment and the resulting torsion angle. Ct212 = △ T / △ it shows how much torque is needed to turn the output shaft into an isolated part. Torsional stiffness is derived from the hysteresis curve. On the graph, you only need to pay attention to the range of 50% to 100% of T2b. Within this range, the curve can be regarded as a straight line.

行星齿轮减速机

PLANETARY PRECISION REDUCER



选用范例：MTA90-20-S2-P1-BCH1304N11A

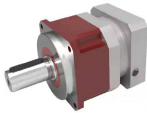
表示 MTA 型减速机的外径 (或边长) 是 90，速比 20，轴键输出型，精密齿隙，配施耐德 BCH1304N11A 电机

MTA 系列性能参数表 / MTA Series Performance Table

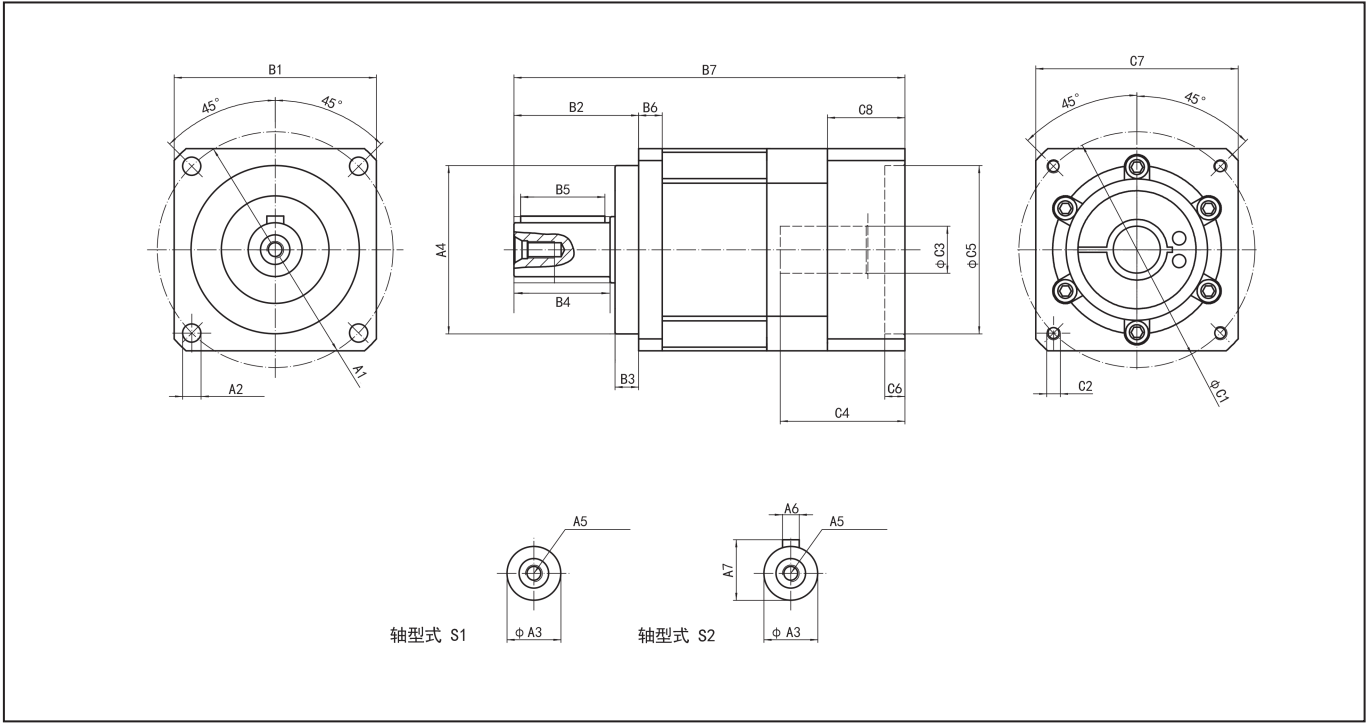
规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTA042	MTA060	MTA090	MTA115	MTA142	MTA180	MTA220
额定输出力矩 Rated output torqueT _{2N}	Nm	1	3	20	35	130	208	342	588	1140
			4	19	50	140	290	542	1050	1700
			5	22	60	160	330	650	1200	2000
			6	20	55	150	310	600	1100	1900
			7	19	50	140	300	550	1100	1800
			8	17	45	120	260	500	1000	1600
			10	14	40	100	230	450	900	1500
		2	12	20	55	160	290	542	1060	1700
			15	20	55	140	208	342	588	1140
			16	20	55	140	208	342	588	1140
			20	19	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			30	20	55	150	310	600	1100	1900
			35	19	50	140	300	550	1100	1800
			40	17	45	120	260	500	1000	1600
			50	22	60	160	330	650	1200	2000
			60	20	55	150	310	600	1100	1900
			70	19	50	140	300	550	1100	1800
			80	17	45	120	260	500	1000	1600
			100	14	40	100	230	450	900	1500
急停扭矩 Emergency stop torqueT _{2NOT}	Nm	1,2	3-100	三倍额定输出力矩 /Triple rated output torque						
额定输入转速 Rated input speed η _{IN}	rpm	1,2	3-100	5000	5000	4000	4000	3000	3000	2000
最大输入转速 Maximum input speed η _{1B}		1,2	3-100	10000	10000	8000	8000	6000	6000	4000
标准齿隙 Standard back gap	arcmin	1	3-10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
		2	12-100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
精密齿隙 Precision backLTashP1	arcmin	1	3-10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
		2	12-100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
扭转刚性 Torsional rigidity	Nm/ arcmin	1,2	3-100	3	7	14	25	50	145	225
容许径向力 Allowable radial force F _{2aB}	N	1,2	3-100	780	1530	3250	6700	9400	14500	50000
容许轴向力 Allowable axial force F _{2aB}	N	1,2	3-100	390	765	1625	3350	4700	7250	25000
使用寿命 Sevice life	hrs	1,2	3-100	20000						
效率 Efficiency	%	1	3-10	≥ 97%						
		2	12-100	≥ 94%						
重量 Gross weight	kg	1	3-10	0.6	1.3	3.7	7.8	14.5	29	48
		2	12-100	0.8	1.5	4.1	9	17.5	33	60
使用温度 Working temperature	°C	1,2	3-100	-10°C ~90°C						
润滑 Lubricating		1,2	3-100	合成润滑油脂 /Synthetic lubricating grease						
防护等级 IP Grade		1,2	3-100	IP65						
安装方向 InstalLTation direction		1,2	3-100	任意方向 /In any direction						
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	3-100	≤ 60	≤ 63	≤ 65	≤ 68	≤ 70	≤ 73	≤ 75

转动惯量斜齿轮
 Moment of inertia helical gear

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTA042	MTA060	MTA090	MTA115	MTA142	MTA180	MTA220
转动惯量 J_i	Kg.cm ²	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
			10	0.03	0.13	0.44	2.57	7.04	22.51	50.63
		2	12	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			15	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			16	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			20	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			25	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			30	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			35	0.03	0.03	0.13	0.44	2.71	7.42	23.29
			40	0.03	0.03	0.13	0.44	2.71	7.42	23.29
			50	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			60	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			70	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			80	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			100	0.03	0.03	0.13	0.44	2.57	7.03	22.51



外形尺寸表
 单位：mm
 Overall dimension table unit: mm

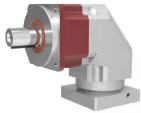


MODEL	MTA042	MTA060	MTA090	MTA115	MTA142	MTA180	MTA220
A1	50	70	100	130	165	215	250
A2	4-Φ3.4	4-Φ5.5	4-Φ6.6	4-Φ9	4-Φ11	4-Φ13	4-Φ17
A3	Φ13 j6	Φ16 j6	Φ22 j6	Φ32 j6	Φ40 j6	Φ55 j6	Φ75 j6
A4	35 g6	50 g6	80 g6	110 g6	130 g6	160 g6	180 g6
A5	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
A6	5 h9	5 h9	6 h9	10 h9	12 h9	16 h9	20 h9
A7	15	18	24.5	35	43	59	79.5
B1	42	60	90	115	142	180	220
B2	26	37	48	65	97	105	138
B3	5.5	7	10	12	15	20	30
B4	19.5	28.5	36.5	51	80	82	105
B5	16	25	32	40	65	70	90
B6	4	7	8	10	12	15	20
B7*	86.5/104.5	116/139	150/160	198.5/212.5	262.5/281	290/329.5	364.5/415
C1*	46	70	90	145	200	215	235
C2*	4-M4X8	4-M4X10	4-M5X12	4-M8X20	4-M12X25	4-M12X25	4-M12X25
C3*	Φ8 F7	Φ14 F7	Φ19 F7	Φ24 F7	Φ35 F7	Φ42 F7	Φ55 F7
C4*	26	37	50	60	82	82	116
C5*	30 G7	50 G7	70 G7	110 G7	114.3 G7	114.3 G7	180 G7
C6*	5	6	8	8	8	8	8
C7*	42	60	90	130	178	190	220
C8*	15	23	27.5	35	39	39	40

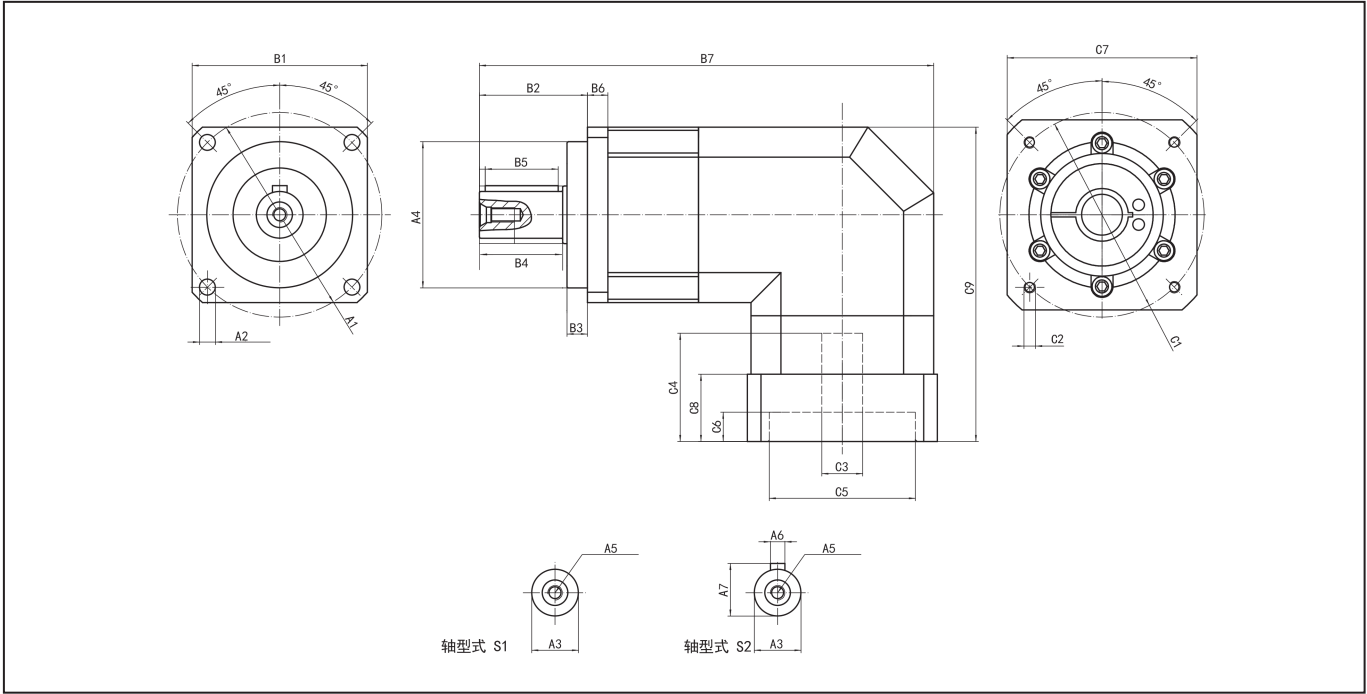
* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。
 * It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

MTAR 系列性能参数表 /MTAR Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTAR042	MTAR060	MTAR090	MTAR115	MTAR142	MTAR180
额定输出力矩 Rated output torqueT _{2N}	Nm	1	3	20	35	130	208	342	588
			4	19	50	140	290	542	1050
			5	22	60	160	330	650	1200
			6	20	55	150	310	600	1100
			7	19	50	140	300	550	1000
			8	17	45	120	260	500	900
		2	10	14	40	100	230	450	1050
			12	20	55	160	290	542	588
			15	20	55	140	208	342	588
			16	20	55	140	208	342	1050
			20	19	50	140	290	542	1050
			25	22	60	160	330	650	1200
			30	20	55	150	310	600	1100
			35	19	50	140	300	550	1100
			40	17	45	120	260	500	1000
			50	22	60	160	330	650	1200
			60	20	55	150	310	600	1100
			70	19	50	140	300	550	1100
			80	17	45	120	260	500	1000
			100	14	40	100	230	450	900
急停扭矩 Emergency stop torqueT _{2NOT}	Nm	1,2	3-100	三倍额定输出力矩 /Triple rated output torque					
额定输入转速 Rated input speed n _{1N}	rpm	1,2	3-100	5000	5000	4000	4000	3000	3000
最大输入转速 Maximum input speed n _{1B}		1,2	3-100	10000	10000	8000	8000	6000	6000
标准齿隙 Standard back gap	arcmin	1	3-10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
		2	12-100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
精密齿隙 Precision backLTAshP1	arcmin	1	3-10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
		2	12-100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭转刚性 Torsional rigidity	Nm/ arcmin	1,2	3-100	3	7	14	25	50	145
容许径向力 Allowable radial force F _{2aR}	N	1,2	3-100	780	1530	3250	6700	9400	14500
容许轴向力 Allowable axial force F _{2aB}	N	1,2	3-100	390	765	1625	3350	4700	7250
使用寿命 Sevice life	hrs	1,2	3-100	20000					
效率 Efficiency	%	1	3-10	≥ 95%					
		2	12-100	≥ 92%					
重量 Gross weight	kg	1	3-10	0.9	2.1	6.4	13	24.5	51
		2	12-100	1.2	1.5	7.8	14.2	27.5	54
使用温度 Working temperature	℃	1,2	3-100	-10℃ ~90℃					
润滑 Lubricating		1,2	3-100	合成润滑油脂 /Synthetic lubricating grease					
防护等级 IP Grade		1,2	3-100	IP65					
安装方向 InstalLTAtion direction		1,2	3-100	任意方向 /In any direction					
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	3-100	≤ 63	≤ 65	≤ 67	≤ 70	≤ 72	≤ 75



外形尺寸表 单位：mm Overall dimension table unit: mm



MODEL	MTAR042	MTAR060	MTAR090	MTAR115	MTAR142	MTAR180
A1	50	70	100	130	165	215
A2	4-Φ3.4	4-Φ5.5	4-Φ6.6	4-Φ9	4-Φ11	4-Φ13
A3	Φ13 j6	Φ16 j6	Φ22 j6	Φ32 j6	Φ40 j6	Φ55 j6
A4	35 g6	50 g6	80 g6	110 g6	130 g6	160 g6
A5	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P
A6	5 h9	5 h9	6 h9	10 h9	12 h9	16 h9
A7	15	18	24.5	35	43	59
B1	42	60	90	115	142	180
B2	26	37	48	65	97	105
B3	5.5	7	10	12	15	20
B4	19.5	28.5	36.5	51	80	82
B5	16	25	32	40	65	70
B6	4	7	8	10	12	15
B7*	109/128	151/174	201.5/199.5	270/264.5	340.5/350	384/417
C1*	46	70	90	145	200	215
C2*	4-M4X8	4-M4X10	4-M5X12	4-M8X20	4-M12X25	4-M12X25
C3*	Φ8 F7	Φ14 F7	Φ19 F7	Φ24 F7	Φ35 F7	Φ42 F7
C4*	27	37	50	60	82	82
C5*	30 G7	50 G7	70 G7	110 G7	114.3 G7	114.3 G7
C6*	5	8	8	8	8	8
C7*	42	60	90	130	178	190
C8*	15	23	27.5	35	39	39
C9*	75.5	110/117.5	142.5/125.5	192/157.5	230/198.5	293/249

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。

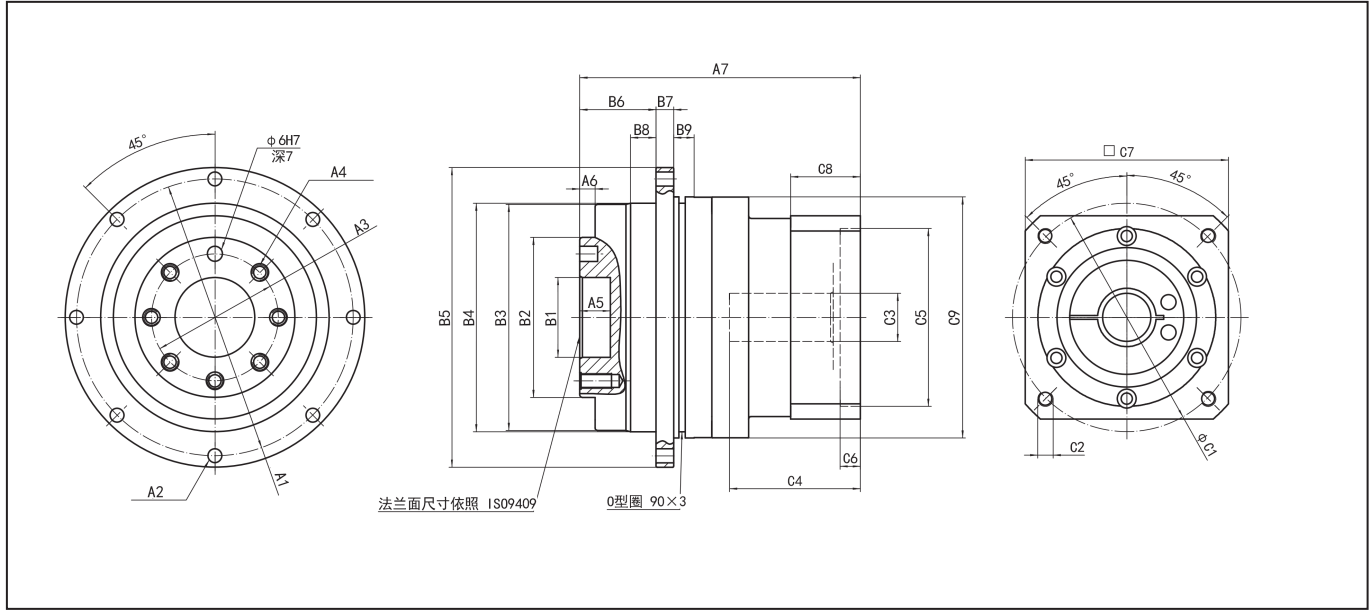
* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

MTD 系列性能参数表 /MTD Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTD047	MTD064	MTD090	MTD110	MTD140	MTD200	MTD255
额定输出力矩 Rated output torqueT _{2N}	Nm	1	4	19	50	140	290	542	1050	1700
			5	22	60	160	330	650	1200	2000
			6	20	55	150	310	600	1100	1900
			7	19	50	140	300	550	1100	1800
			8	17	45	120	260	500	1000	1600
			10	14	40	100	230	450	900	1500
		2	16	20	55	140	208	342	588	1140
			20	19	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			35	19	50	140	300	550	1100	1800
			40	17	45	120	260	500	1000	1600
			50	22	60	160	330	650	1200	2000
			60	20	55	150	310	600	1100	1900
			70	19	50	140	300	550	1100	1800
			80	17	45	120	260	500	1000	1600
			100	14	40	100	230	450	900	1500
急停扭矩 Emergency stop torqueT _{2NOT}	Nm	1,2	4-100	三倍额定输出力矩 /Triple rated output torque						
额定输入转速 Rated input speed n _{1N}	rpm	1,2	4-100	5000	5000	4000	4000	3000	3000	2000
最大输入转速 Maximum input speed n _{1B}		1,2	4-100	10000	10000	8000	8000	6000	6000	4000
标准齿隙 Standard back gap	arcmin	1	3-10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
		2	12-100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
精密齿隙 Precision backLTashP1	arcmin	1	4-10	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
		2	16-100	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
扭转刚性 Torsional rigidity	Nm/arcmin	1,2	4-100	7	13	31	82	151	450	1023
容许径向力 Allowable radial force F _{2aR}	N	1,2	4-100	780	1530	3250	6700	12000	18500	27000
容许轴向力 Allowable axial force F _{2aB}	N	1,2	4-100	500	765	1625	3350	8100	15000	24000
使用寿命 Sevice life	hrs	1,2	4-100	20000						
效率 Efficiency	%	1	4-10	≥ 97%						
		2	16-100	≥ 94%						
重量 Gross weight	kg	1	4-10	0.6	1.3	3.7	7.8	14.5	29	48
		2	16-100	0.8	1.5	4.1	9	17.5	33	60
使用温度 Working temperature	℃	1,2	4-100	-10℃ ~90℃						
润滑 Lubricating		1,2	4-100	合成润滑油脂 /Synthetic lubricating grease						
防护等级 IP Grade		1,2	4-100	IP65						
安装方向 InstallLTation direction		1,2	4-100	任意方向 /In any direction						
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	4-100	≤ 60	≤ 63	≤ 65	≤ 68	≤ 70	≤ 73	≤ 75



外形尺寸表 单位：mm Overall dimension table unit: mm



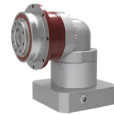
MODEL	MTD047	MTD064	MTD090	MTD110	MTD140	MTD200	MTD255
A1	67	79	109	135	168	233	280
A2	8-Φ3.4	8-Φ4.5	8-Φ5.5	8-Φ5.5	12-Φ6.6	12-Φ9	16-Φ13.5
A3	20	31.5	50	63	80	125	140
A4	4-M3X6.5	7-M5X8	7-M6X12	11-M6X13.5	11-M8X17	11-M10X20	12-M16X30
A5	4	8	12	12	12	16	20
A6	3	3	6	6	6	8	12
A7#	70	80.5	110.5	145	178	190	270
B1	12H7	20H7	31.5H7	40H7	50H7	80H7	100H7
B2	28h7	40h7	63h7	80h7	100h7	160h6	180h7
B3	46.2	63.5	89	109	139	199	254
B4	47g6	64g6	90g6	110g6	140g6	200g6	255g6
B5	72	86	118	145	179	247	300
B6	19.5	19.5	30	29	38	50	66
B7	4	4	7	7	10	10	18
B8	7	7	10	10	15	15	20
B9	5	7.7	8	10	12	15	20
C1*	46	70	90	145	200	215	235
C2*	4-M4X10	4-M4X10	4-M5X12	4-M8X20	4-M12X25	4-M12X25	4-M12X25
C3*	Φ8 F7	Φ14 F7	Φ19 F7	Φ24 F7	Φ35 F7	Φ42 F7	Φ55 F7
C4*	28	37	50	60	82	82	116
C5*	30 G7	50 G7	70 G7	110 G7	114.3 G7	114.3 G7	180 G7
C6*	4	8	8	8	8	8	8
C7*	48	65	90	130	178	190	270
C8*	15	23	27.5	35	39	39	40
C9	60h7	70h7	95h7	120h7	152h7	212h7	212h7

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。

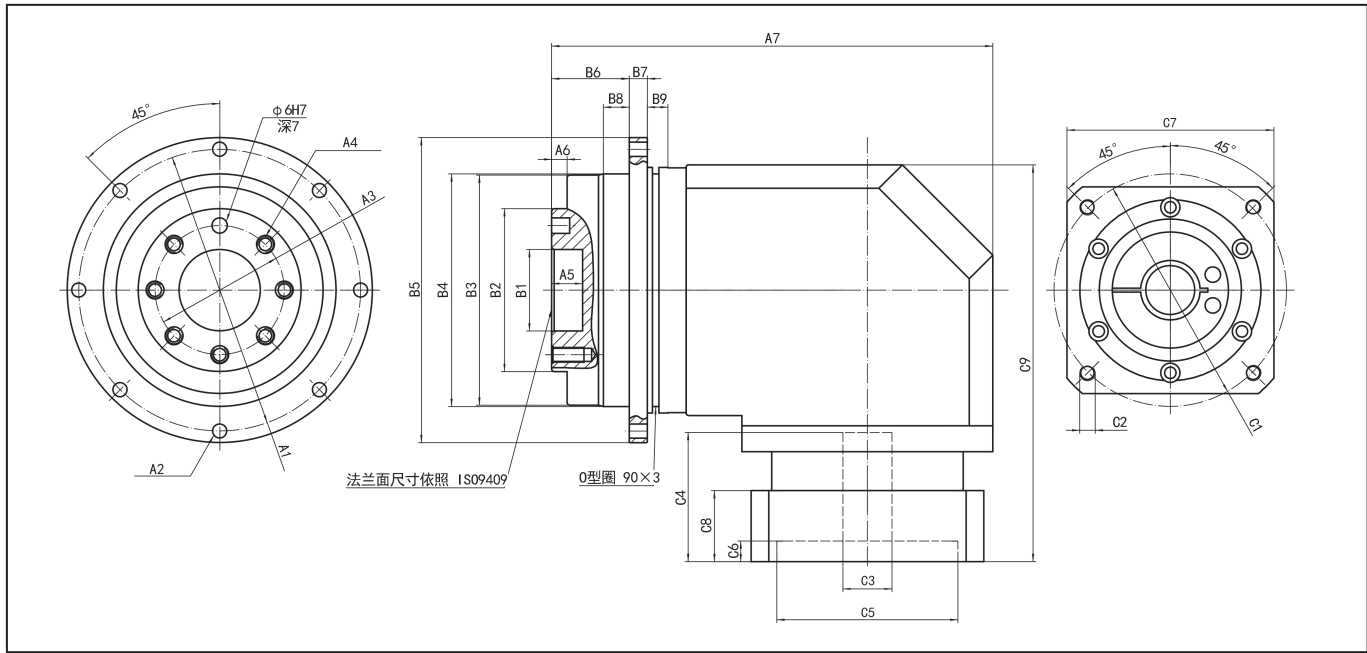
* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

MTDR 系列性能参数表 /MTDR Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTDR047	MTDR064	MTDR090	MTDR110	MTDR140	MTDR200
额定出力矩 Rated output torqueT _{2N}	Nm	1	4	19	50	140	290	542	1050
			5	22	60	160	330	650	1200
			6	20	55	150	310	600	1100
			7	19	50	140	300	550	1100
			8	17	45	120	260	500	1000
			10	14	40	100	230	450	900
		2	16	20	55	140	208	342	588
			20	19	50	140	290	542	1050
			25	22	60	160	330	650	1200
			35	19	50	140	300	550	1100
			40	17	45	120	260	500	1000
			50	22	60	160	330	650	1200
			60	20	55	150	310	600	1100
			70	19	50	140	300	550	1100
			80	17	45	120	260	500	1000
			100	14	40	100	230	450	900
急停扭矩 Emergency stop torqueT _{2NOT}	Nm	1,2	4-100	三倍额定出力矩 /Triple rated output torque					
额定输入转速 Rated input speed n _{1N}	rpm	1,2	4-100	5000	5000	4000	4000	3000	3000
最大输入转速 Maximum input speed n _{1B}		1,2	4-100	10000	10000	8000	8000	6000	6000
标准齿隙 Standard back gap	arcmin	1	4-10	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
		2	16-100	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9	≤ 9
精密齿隙 Precision backLTashP1	arcmin	1	4-10	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
		2	16-100	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7	≤ 7
扭转刚性 Torsional rigidity	Nm/ arcmin	1,2	4-100	7	13	31	82	151	450
容许径向力 Allowable radial force F _{2aB}	N	1,2	4-100	780	1530	3250	6700	12000	18500
容许轴向力 Allowable axial force F _{2aB}	N	1,2	4-100	500	765	1625	3350	8100	15000
使用寿命 Sevice life	hrs	1,2	4-100	20000					
效率 Efficiency	%	1	4-10	≥ 95%					
		2	16-100	≥ 92%					
重量 Gross weight	kg	1	4-10	1.1	2.1	5.9	10.5	21.9	50.9
		2	16-100	1.4	1.9	4.5	9.8	20.1	45.4
使用温度 Working temperature	℃	1,2	4-100	-10℃ ~90℃					
润滑 Lubricating		1,2	4-100	合成润滑油脂 /Synthetic lubricating grease					
防护等级 IP Grade		1,2	4-100	IP65					
安装方向 InstallATation direction		1,2	4-100	任意方向 /In any direction					
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	4-100	≤ 63	≤ 65	≤ 67	≤ 70	≤ 72	≤ 75



外形尺寸表 单位：mm Overall dimension table unit: mm



MODEL	MTDR047	MTDR064	MTDR090	MTDR110	MTDR140	MTDR200
A1	67	79	109	135	168	233
A2	8-Φ3.4	8-Φ4.5	8-Φ5.5	8-Φ5.5	12-Φ6.6	12-Φ9
A3	20	31.5	50	63	80	125
A4	4-M3X6.5	7-M5X8	7-M6X12	11-M6X13.5	11-M8X17	11-M10X20
A5	4	8	12	12	12	16
A6	3	3	6	6	6	8
A7#	105.5	127.5	170.5	219	255	337
B1	12H7	20H7	31.5H7	40H7	50H7	80H7
B2	28h7	40h7	63h7	80h7	100h7	160h6
B3	46.2	63.5	89	109	139	199
B4	47g6	64g6	90g6	110g6	140g6	200g6
B5	72	86	118	145	179	247
B6	19.5	19.5	30	29	38	50
B7	4	4	7	7	10	10
B8	7	7	10	10	15	15
B9	5	7.7	8	10	12	15
C1*	46	70	90	145	200	215
C2*	4-M4X10	4-M4X10	4-M5X12	4-M8X20	4-M12X25	4-M12X25
C3*	Φ8 F7	Φ14 F7	Φ19 F7	Φ24 F7	Φ35 F7	Φ42 F7
C4*	27	37	50	60	82	82
C5*	30 G7	50 G7	70 G7	110 G7	114.3 G7	114.3 G7
C6*	5	8	8	8	8	8
C7*	48	65	90	130	178	190
C8*	15	23	27.5	35	39	39
C9*	99.5	116	153.5	184	247	317

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。

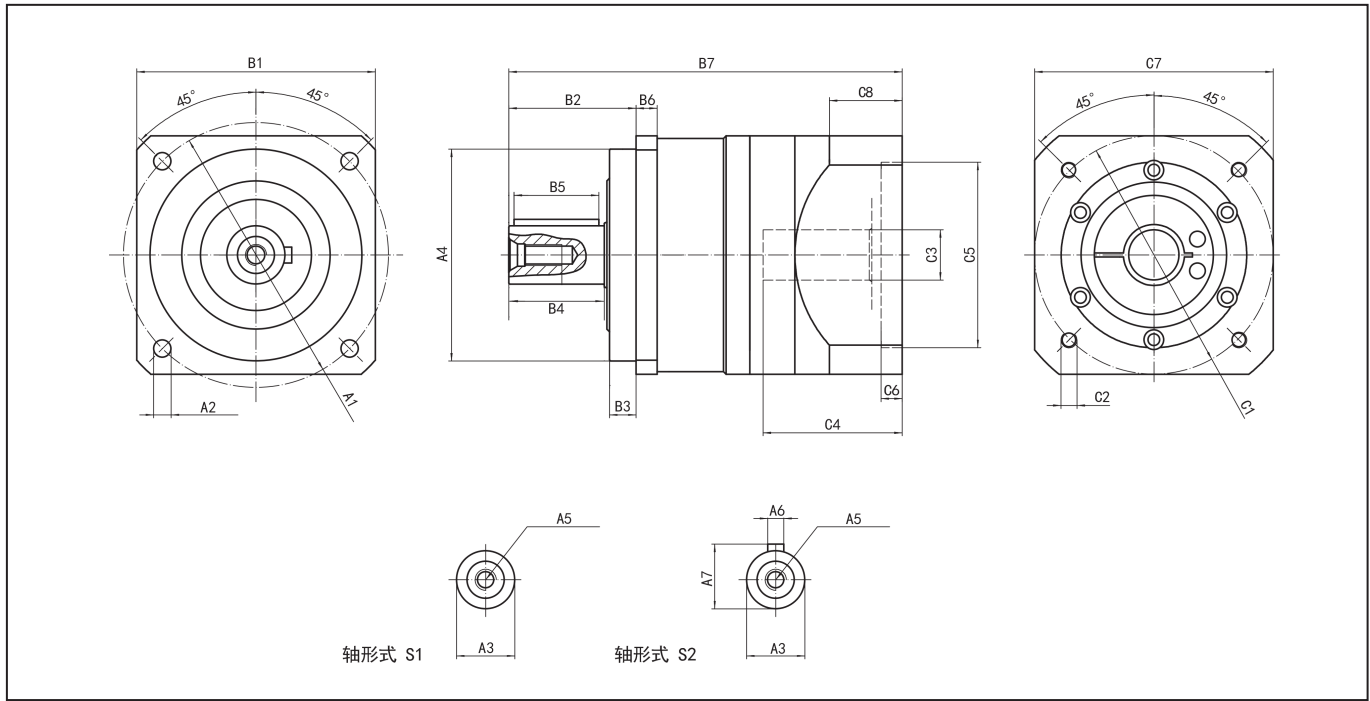
* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

MTB 系列性能参数表 /MTB Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTB060	MTB090	MTB120
额定输出力矩 Rated output torqueT2N	Nm	1	3	35	130	208
			4	50	140	290
			5	60	160	330
			6	55	150	310
			7	50	140	300
			8	45	120	260
			10	40	100	230
		2	12	55	160	290
			15	55	140	208
			16	55	140	208
			20	50	140	290
			25	60	160	330
			30	55	150	310
			35	50	140	300
			40	45	120	260
			50	60	160	330
			60	55	150	310
			70	50	140	300
			80	45	120	260
			100	40	100	230
急停扭矩 Emergency stop torqueT2NOT	Nm	1,2	3-100	三倍额定输出力矩 /Triple rated output torque		
额定输入转速 Rated input speed η_{1N}	rpm	1,2	3-100	5000	4000	4000
最大输入转速 Maximum input speed η_{1B}		1,2	3-100	10000	8000	8000
标准齿隙 Standard back gap	arcmin	1	3-10	≤ 7	≤ 7	≤ 7
		2	12-100	≤ 10	≤ 10	≤ 10
精密齿隙 Precision backLTAshP1	arcmin	1	3-10	≤ 5	≤ 5	≤ 5
		2	12-100	≤ 8	≤ 8	≤ 8
扭转刚性 Torsional rigidity	Nm/arcmin	1,2	3-100	7	14	25
容许径向力 Allowable radial force F _{2aB}	N	1,2	3-100	1530	3250	6700
容许轴向力 Allowable axial force F _{2aB}	N	1,2	3-100	765	1625	3350
使用寿命 Sevice life	hrs	1,2	3-100	20000		
效率 Efficiency	%	1	3-10	≥ 97%		
		2	12-100	≥ 94%		
重量 Gross weight	kg	1	3-10	1.3	3.7	7.8
		2	12-100	1.5	4.1	9
使用温度 Working temperature	℃	1,2	3-100	-10℃ ~90℃		
润滑 Lubricating		1,2	3-100	合成润滑油脂 /Synthetic lubricating grease		
防护等级 IP Grade		1,2	3-100	IP65		
安装方向 InstallLTation direction		1,2	3-100	任意方向 /In any direction		
噪音值 (n1=3000rpm, 无负载)Noise level (n1=3000rpm,off load)	dB	1,2	3-100	≤ 63	≤ 65	≤ 68



外形尺寸表 单位：mm Overall dimension table unit: mm



MODEL	MTB060	MTB090	MTB120
A1	70	100	130
A2	4-Φ5.5	4-Φ6.6	4-Φ9
A3	Φ16 j6	Φ22 j6	Φ32 j6
A4	50 g6	80 g6	110 g6
A5	M5X0.8P	M8X1.25P	M12X1.75P
A6	5 h9	6 h9	10 h9
A7	18	24.5	35
B1	60	90	115
B2	37	48	65
B3	7	10	12
B4	28.5	36	51
B5	25	32	40
B6	7	8	12
B7*	116/139	148.5/156.5	198.5/212.5
C1*	70	90	145
C2*	4-M4X10	4-M5X12	4-M8X20
C3*	Φ14 F7	Φ19 F7	Φ24 F7
C4*	37	50	60
C5*	50 G7	70 G7	110 G7
C6*	6	8	8
C7*	62.5	90	130
C8*	23	27.5	35

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。

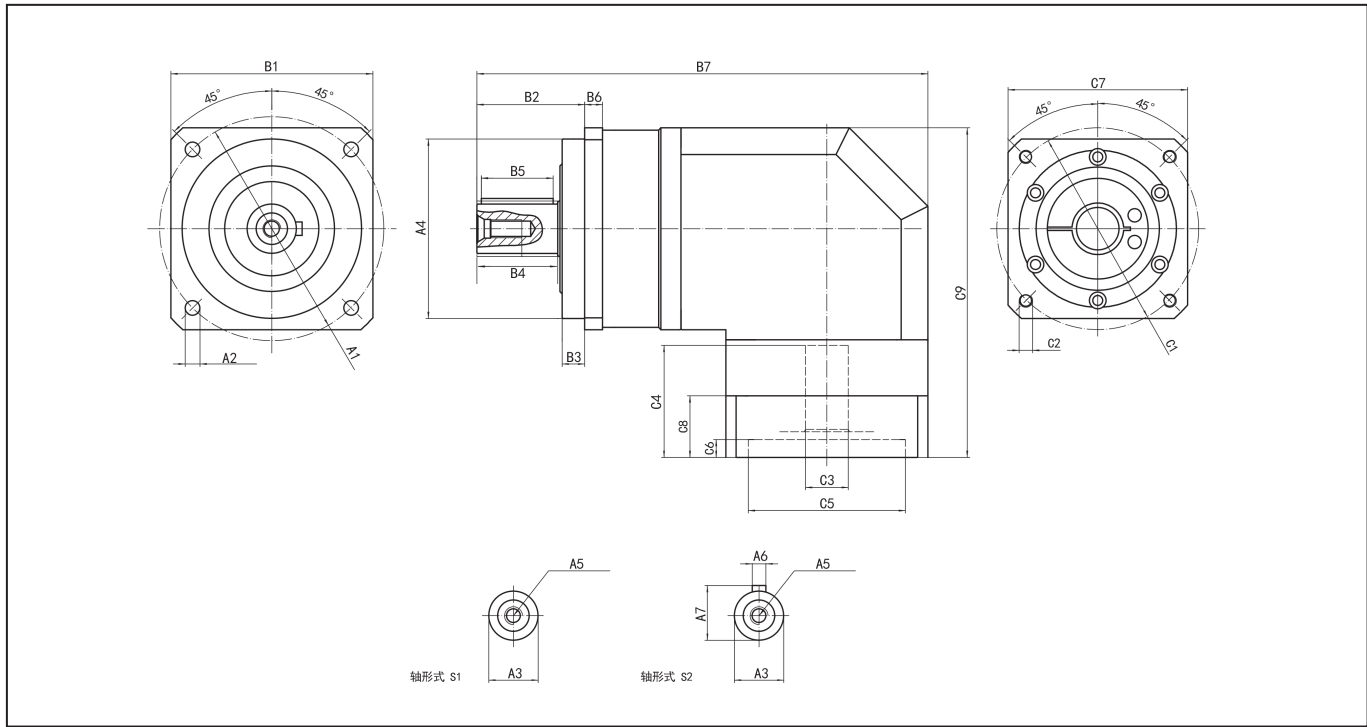
* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

MTBR 系列性能参数表 /MTBR Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTBR060	MTBR090	MTBR120
额定出力矩 Rated output torqueT2N	Nm	1	3	35	130	208
			4	50	140	290
			5	60	160	330
			6	55	150	310
			7	50	140	300
			8	45	120	260
			10	40	100	230
		2	12	55	160	290
			15	55	140	208
			16	55	140	208
			20	50	140	290
			25	60	160	330
			30	55	150	310
			35	50	140	300
			40	45	120	260
			50	60	160	330
			60	55	150	310
			70	50	140	300
			80	45	120	260
			100	40	100	230
急停扭矩 Emergency stop torqueT2NOT	Nm	1,2	3-100	三倍额定出力矩 /Triple rated output torque		
额定输入转速 Rated input speed η_{iN}	rpm	1,2	3-100	5000	4000	4000
最大输入转速 Maximum input speed η_{iB}		1,2	3-100	10000	8000	8000
标准齿隙 Standard back gap	arcmin	1	3-10	≤ 9	≤ 9	≤ 9
		2	12-100	≤ 11	≤ 11	≤ 11
精密齿隙 Precision backLTAshP1	arcmin	1	3-10	≤ 7	≤ 7	≤ 7
		2	12-100	≤ 9	≤ 9	≤ 9
扭转刚性 Torsional rigidity	Nm/arcmin	1,2	3-100	7	14	25
容许径向力 Allowable radial force F2aB	N	1,2	3-100	1530	3250	6700
容许轴向力 Allowable axial force F2aB	N	1,2	3-100	765	1625	3350
使用寿命 Sevice life	hrs	1,2	3-100	20000		
效率 Efficiency	%	1	3-10	≥ 95%		
		2	12-100	≥ 92%		
重量 Gross weight	kg	1	3-10	2.1	5.4	
		2	12-100	2.7	6.5	
使用温度 Working temperature	°C	1,2	3-100	-10°C ~90°C		
润滑 Lubricating		1,2	3-100	合成润滑油脂 /Synthetic lubricating grease		
防护等级 IP Grade		1,2	3-100	IP65		
安装方向 InstalLTation direction		1,2	3-100	任意方向 /In any direction		
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	3-100	≤ 65	≤ 67	≤ 70



外形尺寸表 单位：mm Overall dimension table unit: mm



MODEL	MTBR060	MTBR090	MTBR120
A1	70	100	130
A2	4-Φ5.5	4-Φ6.6	4-Φ9
A3	Φ16 j6	Φ22 j6	Φ32 j6
A4	50 g6	80 g6	110 g6
A5	M5X0.8P	M8X1.25P	M12X1.75P
A6	5 h9	6 h9	10 h9
A7	18	24.5	35
B1	60	90	115
B2	37	48	65
B3	7	10	12
B4	28.5	36	51
B5	25	32	40
B6	7	8	12
B7*	151/174	148.5/156.5	198.5/212.5
C1*	70	90	145
C2*	4-M4X10	4-M5X12	4-M8X20
C3*	Φ14 F7	Φ19 F7	Φ24 F7
C4*	37	50	60
C5*	50 G7	70 G7	110 G7
C6*	8	8	8
C7*	65	90	130
C8*	23	27.5	35
C9*	110/117.5	142.5/125	192/157.5

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。

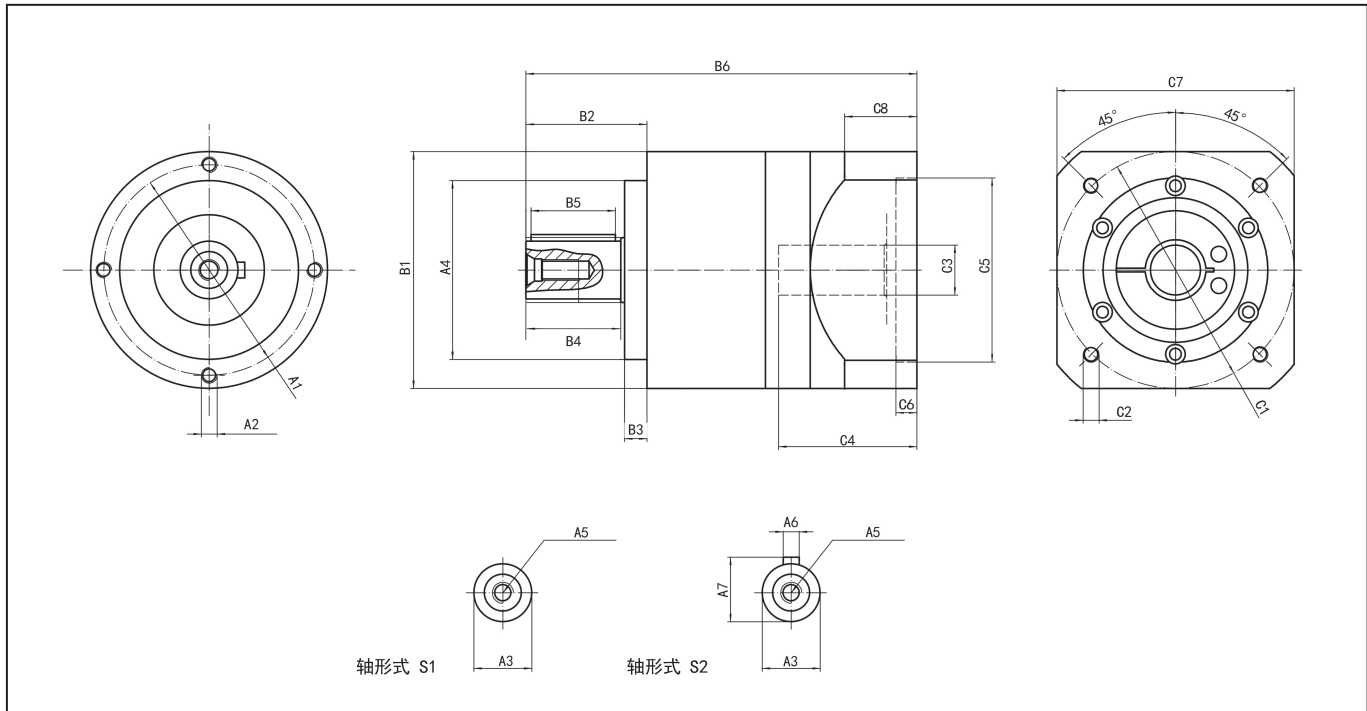
* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

MTC 系列性能参数表 /MTC Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTC060	MTC090	MTC120
额定输出力矩 Rated output torqueT _{2N}	Nm	1	3	35	130	208
			4	50	140	290
			5	60	160	330
			6	55	150	310
			7	50	140	300
			8	45	120	260
		2	10	40	100	230
			12	55	160	290
			15	55	140	208
			16	55	140	208
			20	50	140	290
			25	60	160	330
			30	55	150	310
			35	50	140	300
			40	45	120	260
			50	60	160	330
			60	55	150	310
			70	50	140	300
			80	45	120	260
			100	40	100	230
急停扭矩 Emergency stop torqueT _{2NOT}	Nm	1,2	3-100	三倍额定输出力矩 /Triple rated output torque		
额定输入转速 Rated input speed n _{1N}	rpm	1,2	3-100	5000	4000	4000
最大输入转速 Maximum input speed n _{1is}		1,2	3-100	10000	8000	8000
标准齿隙 Standard back gap	arcmin	1	3-10	≤ 7	≤ 7	≤ 7
		2	12-100	≤ 10	≤ 10	≤ 10
精密齿隙 Precision backLTashP1	arcmin	1	3-10	≤ 5	≤ 5	≤ 5
		2	12-100	≤ 8	≤ 8	≤ 8
扭转刚性 Torsional rigidity	Nm/arcmin	1,2	3-100	7	14	25
容许径向力 Allowable radial force F _{2aB}	N	1,2	3-100	1530	3250	6700
容许轴向力 Allowable axial force F _{2aB}	N	1,2	3-100	765	1625	3350
使用寿命 Sevice life	hrs	1,2	3-100	20000		
效率 Efficiency	%	1	3-10	≥ 97%		
		2	12-100	≥ 94%		
重量 Gross weight	kg	1	3-10	1.3	3.7	7.8
		2	12-100	1.5	4.1	9
使用温度 Working temperature	℃	1,2	3-100	-10℃ ~90℃		
润滑 Lubricating		1,2	3-100	合成润滑油脂 /Synthetic lubricating grease		
防护等级 IP Grade		1,2	3-100	IP65		
安装方向 InstallLTAtion direction		1,2	3-100	任意方向 /In any direction		
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	3-100	≤ 63	≤ 65	≤ 68



外形尺寸表 单位：mm Overall dimension table unit: mm



MODEL	MTC060	MTC090	MTC120
A1	62	80	108
A2	4-M5X10	4-M6X12	4-M8X16
A3	Φ16 j6	Φ22 j6	Φ32 j6
A4	50 g6	68 g6	90 g6
A5	M5X0.8P	M8X1.25P	M12X1.75P
A6	5 h9	6 h9	10 h9
A7	18	24.5	35
B1	70	90	120
B2	36	46	70
B3	6.5	8.5	17
B4	28.5	36	51
B5	25	32	40
B6*	116/139	148.5/156.5	198.5/212.5
C1*	70	90	145
C2*	4-M4X10	4-M5X12	4-M8X20
C3*	Φ14 F7	Φ19 F7	Φ24 F7
C4*	37	50	60
C5*	50 G7	70 G7	110 G7
C6*	8	8	8
C7*	62.5	90	130
C8*	23	27.5	35

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。

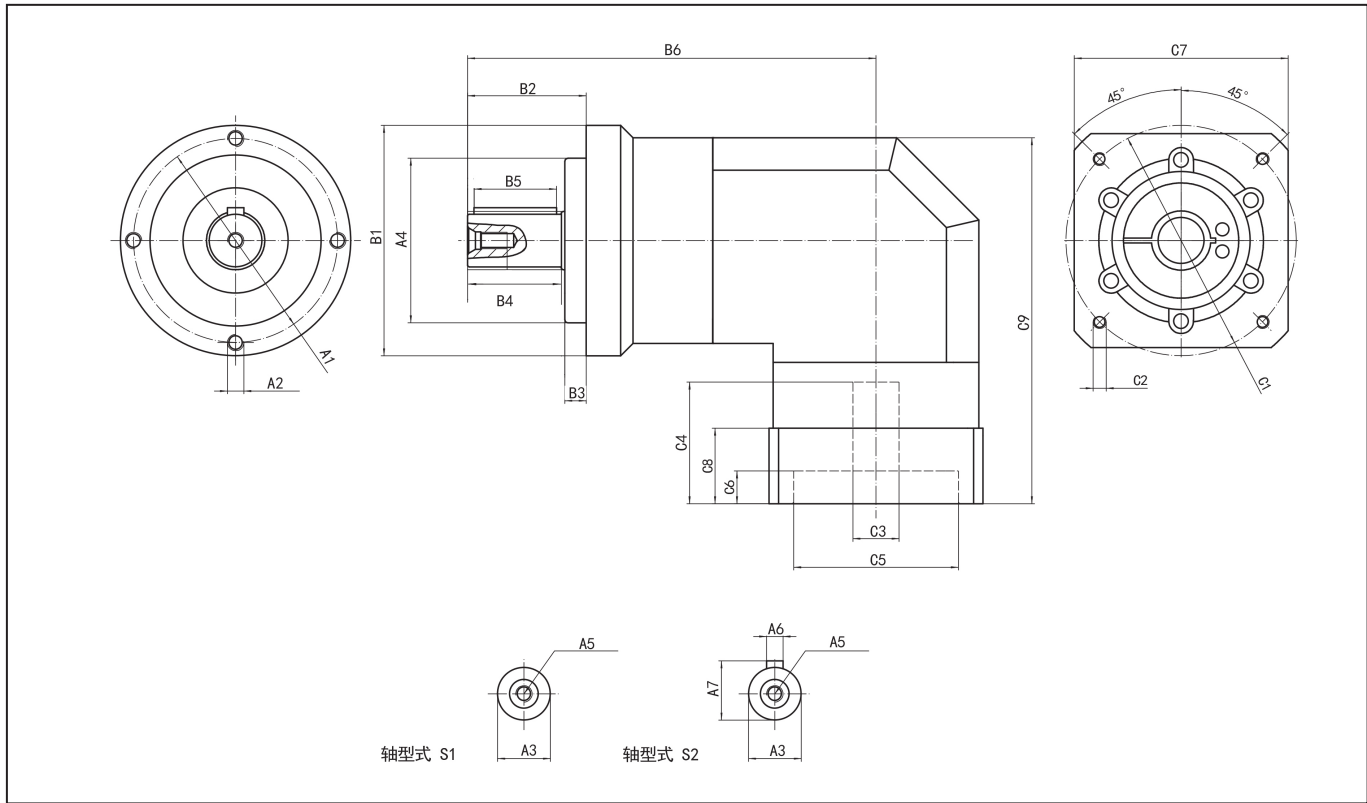
* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

MTCR 系列性能参数表 /MTCR Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	MTCR060	MTCR090	MTCR120
额定输出力矩 Rated output torqueT2N	Nm	1	3	35	130	208
			4	50	140	290
			5	60	160	330
			6	55	150	310
			7	50	140	300
			8	45	120	260
			10	40	100	230
		2	12	55	160	290
			15	55	140	208
			16	55	140	208
			20	50	140	290
			25	60	160	330
			30	55	150	310
			35	50	140	300
			40	45	120	260
			50	60	160	330
			60	55	150	310
			70	50	140	300
			80	45	120	260
			100	40	100	230
急停扭矩 Emergency stop torqueT _{2NOT}	Nm	1,2	3-100	三倍额定输出力矩 /Triple rated output torque		
额定输入转速 Rated input speed n _{1N}	rpm	1,2	3-100	5000	4000	4000
最大输入转速 Maximum input speed n _{1B}		1,2	3-100	10000	8000	8000
标准齿隙 Standard back gap	arcmin	1	3-10	≤ 9	≤ 9	≤ 9
		2	12-100	≤ 11	≤ 11	≤ 11
精密齿隙 Precision backLTashP1	arcmin	1	3-10	≤ 7	≤ 7	≤ 7
		2	12-100	≤ 9	≤ 9	≤ 9
扭转刚性 Torsional rigidity	Nm/arcmin	1,2	3-100	7	14	25
容许径向力 Allowable radial force F _{2aB}	N	1,2	3-100	1530	3250	6700
容许轴向力 Allowable axial force F _{2aB}	N	1,2	3-100	765	1625	3350
使用寿命 Sevice life	hrs	1,2	3-100	20000		
效率 Efficiency	%	1	3-10	≥ 95%		
		2	12-100	≥ 92%		
重量 Gross weight	kg	1	3-10	2.1	5.4	11.5
		2	12-100	2.7	6.5	12.5
使用温度 Working temperature	℃	1,2	3-100	-10℃ ~90℃		
润滑 Lubricating		1,2	3-100	合成润滑油脂 /Synthetic lubricating grease		
防护等级 IP Grade		1,2	3-100	IP65		
安装方向 InstalLTation direction		1,2	3-100	任意方向 /In any direction		
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	3-100	≤ 65	≤ 67	≤ 70



外形尺寸表 单位：mm Overall dimension table unit: mm



MODEL	MTCR060	MTCR090	MTCR120
A1	62	80	108
A2	4-M5X10	4-M6X12	4-M8X16
A3	Φ16 j6	Φ22 j6	Φ32 j6
A4	50 g6	68 g6	90 g6
A5	M5X0.8P	M8X1.25P	M12X1.75P
A6	5 h9	6 h9	10 h9
A7	18	24.5	35
B1	70	90	120
B2	36	46	70
B3	6.5	8.5	17
B4	28.5	36	51
B5	25	32	40
B6*	151/174	201.5/199.5	270/264.5
C1*	70	90	145
C2*	4-M4X10	4-M5X12	4-M8X20
C3*	Φ14 F7	Φ19 F7	Φ24 F7
C4*	37	50	60
C5*	50 G7	70 G7	110 G7
C6*	8	8	8
C7*	65	90	130
C8*	23	27.5	35
C9*	110/117.5	142.5/125.5	192/157.5

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。

* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

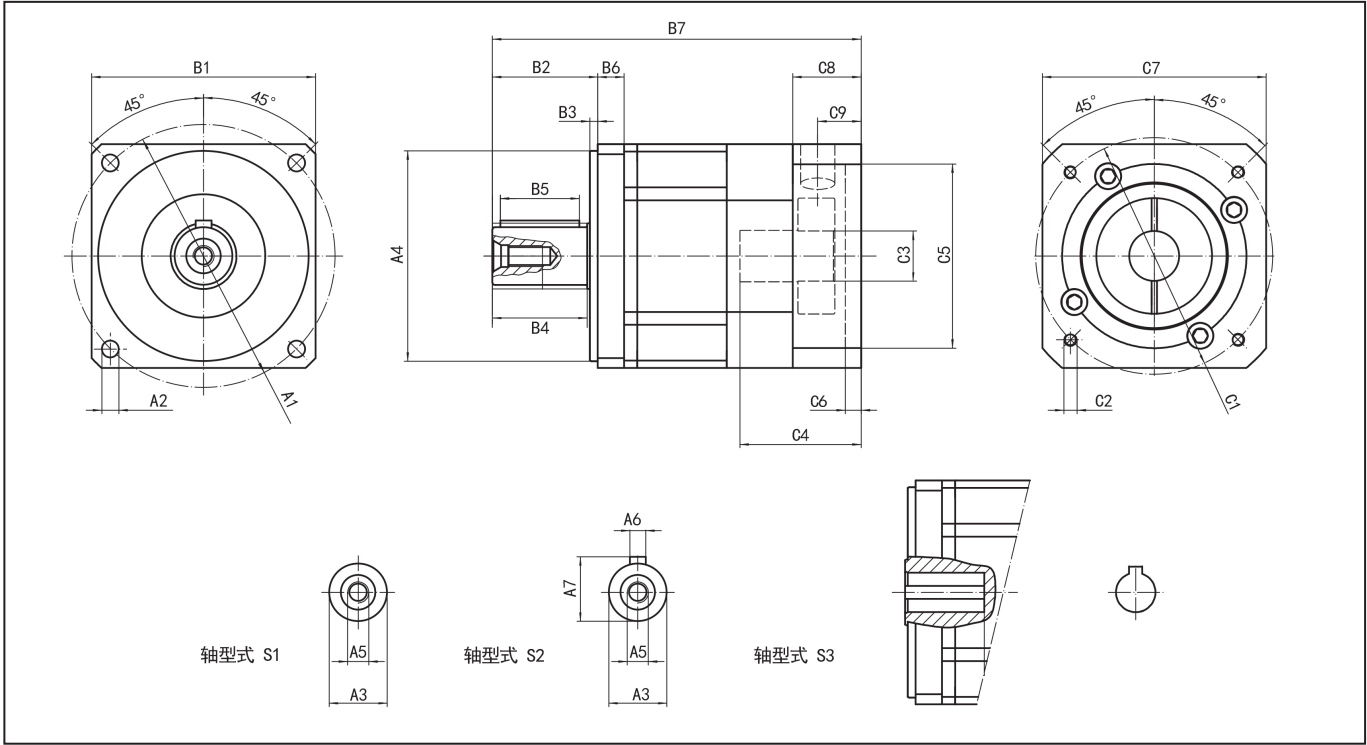
LTA 系列性能参数表 /LTA Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	LTA042	LTA060	LTA090	LTA115	LTA142	LTA190	LTA240	LTA280	LTA330
额定输出力矩 Rated output torqueT _{2N}	Nm	1	3	9	20	50	140	310	1060	1600	-	-
			4	18	35	90	240	605	1780	3500	5800	10190
			5	16	32	70	240	605	1345	2640	4400	7180
			7	-	-	50	100	320	-	-	-	-
			8	9	20	50	90	300	750	1480	2595	4080
		2	10	7	15	35	90	250	500	-	-	-
			9	9	25	50	140	340	1050	1840	-	-
			12	18	25	50	140	340	1030	1840	4400	10000
			15	16	25	50	140	340	1485	1840	5200	8800
			16	20	40	100	260	680	2035	3710	6400	10800
			20	20	40	100	260	680	2035	3710	6400	10800
			25	20	35	80	260	680	1485	2805	4710	7550
			32	20	40	100	260	680	2035	3710	6400	10800
			40	20	35	80	260	680	2035	2805	4710	7550
			50	20	35	80	260	680	1485	2805	-	-
			64	20	20	41	-	-	-	1500	2650	4500
			60	-	35	60	260	450	2590	1950	6400	10800
			64	25	44	110	260	680	2590	3950	8130	13700
			80	25	44	110	260	680	2590	3950	8130	13700
		3	100	25	44	110	260	680	2590	3950	8130	13700
			120	-	25	60	260	450	1450	1950	5800	9800
			125	25	30	90	260	680	1850	3000	6030	9800
			160	25	44	110	260	680	2590	3950	8130	13700
			200	25	40	90	260	680	1855	3950	6030	9800
			250	25	-	-	260	680	1600	3000	6030	8800
			256	20	44	110	-	-	-	-	-	-
			280	-	-	-	260	680	-	-	-	-
			320	20	40	60	-	-	2590	3950	6030	9800
			350	-	-	-	260	680	-	-	-	-
			400	20	-	-	260	680	2590	3950	-	-
			500	-	-	-	260	680	1600	3000	-	-
			512	-	25	52	-	-	-	-	2700	5230
			1000	-	-	-	100	275	1070	-	-	-
急停扭矩 Emergency stop torqueT _{2HOT}	Nm	1,2,3	3-1000	二倍额定输出力矩 /Twice rated output torque								
额定输入转速 Rated input speed η_{IN}	rpm	1,2,3	3-1000	4500	4500	4000	3000	3000	2000	1500	1500	1500
最大输入转速 Maximum input speed η_{IB}		1,2,3	3-1000	6000	6000	6000	6000	4000	3500	3000	3000	3000
精密齿隙 Precision backLTAshP1	arcmin	1	3-10	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 15	≤ 15
		2	9-64	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 18	≤ 18
		3	60-1000	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 22	≤ 22
扭转刚性 Torsional rigidity	Nm/ arcmin	1,2,3	3-1000	0.9	1.8	4.4	9.2	26.7	66.7	123.3	213.3	339
容许径向力 Allowable radial force F _{2aB}	N	1,2,3	3-1000	170	265	440	1240	3700	6500	10500	15000	17000
容许轴向力 Allowable axial force F _{2aB}	N	1,2,3	3-1000	140	200	400	1000	3000	5000	8000	12000	15000
使用寿命 Sevice life	hrs	1,2,3	3-1000	20000								
效率 Efficiency	%	1	3-10	≥ 97%								
		2	9-64	≥ 94%								
		3	60-1000	≥ 91%								
重量 Gross weight	kg	1	3-10	0.6	1.2	2.7	9.8	20	36	50	110	160
		2	9-64	0.8	1.5	3.4	12.1	25	48	65	135	180
		3	60-1000	1	1.9	4.1	14.9	30	53	72	145	192
使用温度 Working temperature	°C	1,2,3	3-1000	-10°C ~90°C								
润滑 Lubricating		1,2,3	3-1000	合成润滑油脂 /Synthetic lubricating grease								
防护等级 IP Grade		1,2,3	3-1000	IP65								
安装方向 InstallLTation direction		1,2,3	3-1000	任意方向 /In any direction								
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	3-1000	≤ 57	≤ 62	≤ 65	≤ 65	≤ 67	≤ 68	≤ 70	≤ 73	≤ 75

转动惯量直齿轮 Moment of inertia spur gear

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	LTA042	LTA060	LTA090	LTA115	LTA142	LTA190	LTA240	LTA280	LTA330
转动惯量 J ₁	kg.cm ²	1	3	-	0.135	0.77	2.63	12.14	15.6	15.6	-	-
			4	-0.022	0.093	0.52	1.79	7.78	16.3	16.3	40.2	75.1
			5	0.019	0.078	0.45	1.53	6.07	15.4	15.4	39.9	73.4
			7	-	-	0.40	1.32	4.63	-	-	-	-
			8	0.017	0.065	0.39	1.32	4.63	16.10	16.1	34.5	62.5
			10	0.016	0.065	0.39	1.32	4.63	15.20	-	-	-
			9	0.015	0.131	0.74	2.62	12.14	15.9	15.9	-	-
			12	0.007	0.127	0.72	2.62	12.37	15.9	15.9	18.8	24.0
		2	15	0.007	0.077	0.71	2.62	12.35	15.9	15.9	18.8	23.0
			16	0.005	0.088	0.50	2.62	7.47	15.0	15.0	18.8	23.8
			20	0.007	0.075	0.44	2.53	6.65	15.0	15.0	18.8	23.8
			25	0.007	0.075	0.44	1.50	5.81	15.7	15.0	18.3	23.3
			32	0.007	0.064	0.39	1.50	5.81	15.3	15.7	16.8	24.0
			40	0.005	0.064	0.39	1.30	5.28	16.10	16.1	16.6	21.6
			50	0.005	0.064	0.39	1.30	5.28	15.20	15.2	-	21.6
			64	0.015	0.064	0.39	1.30	5.28	7.50	14.3	15.2	18.2
			60	0.007	0.076	0.51	1.12	7.50	7.50	7.50	17.7	19.7
			64	0.007	0.076	0.50	1.12	7.50	7.50	7.50	17.8	19.8
			80	0.007	0.075	0.50	1.12	7.50	7.50	7.50	14.8	19.8
			100	0.007	0.075	0.44	1.50	7.40	7.40	7.40	14.8	18.8
		3	120	0.005	0.064	0.70	1.50	7.30	7.30	7.30	14.8	18.8
			125	0.007	0.064	0.65	1.50	7.20	7.20	7.20	13.54	18.5
			160	0.013	0.064	0.39	1.30	6.50	6.50	6.50	13.54	17.5
			200	0.007	0.064	0.39	1.30	6.20	6.20	6.20	13.54	16.5
			250	-	-	-	1.30	5.40	5.40	5.10	13.50	16.5
			280	-	-	-	1.30	5.70	-	-	-	-
			320	0.007	0.064	0.39	1.30	5.40	5.70	5.70	13.3	15.3
			350	-	-	-	1.30	5.40	-	-	-	-
			400	-	-	-	1.30	5.20	5.20	5.20	-	-
			500	-	-	-	1.30	5.10	5.10	5.10	-	-
			512	0.007	0.064	0.39	-	-	-	-	10.5	15.5
			1000	-	-	-	1.30	4.90	4.90	-	M2	-

外形尺寸表 单位: mm Overall dimension table unit: mm

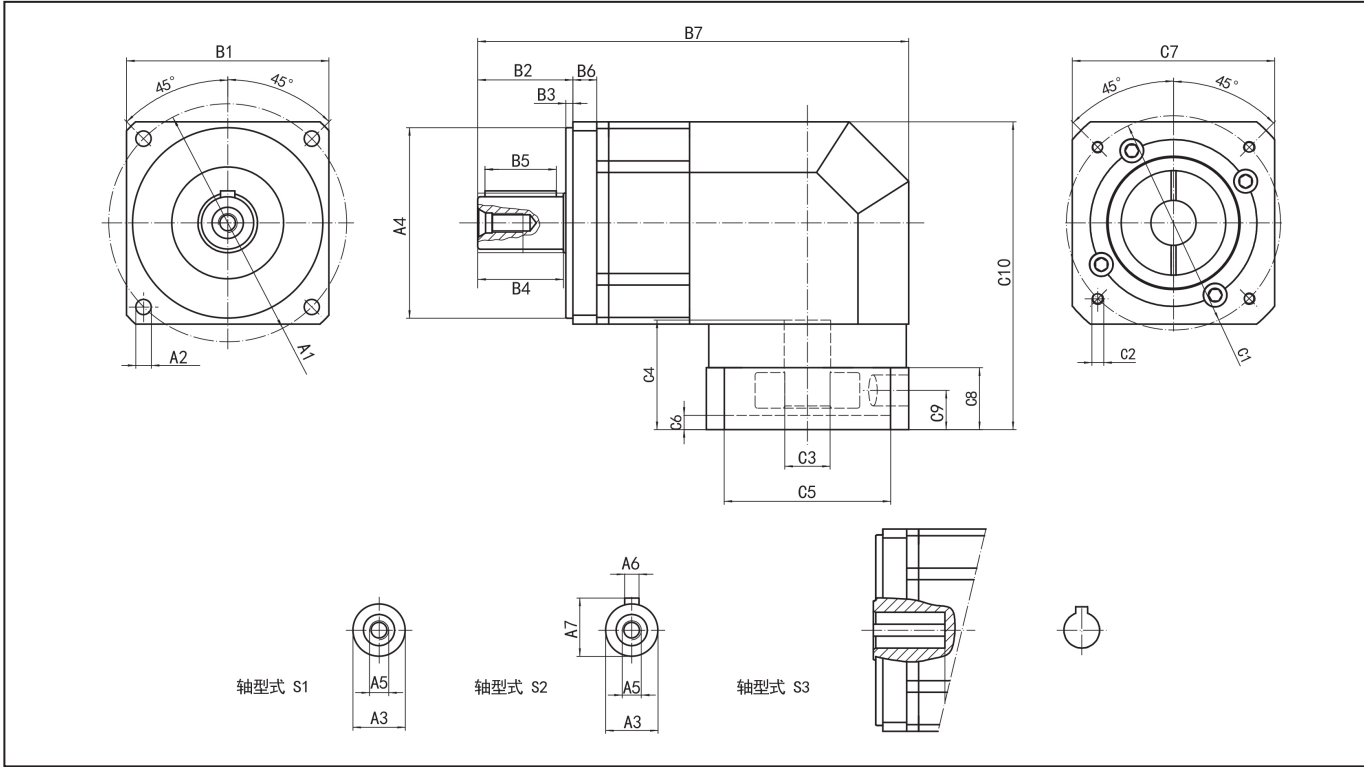


MODEL	LTA042	LTA060	LTA090	LTA115	LTA142	LTA190	LTA240	LTA280	LTA330
A1	50	70	100	130	165	215	265	315	370
A2	Φ3.4	Φ5.5	Φ6.5	Φ9	Φ11	Φ13	Φ18	Φ22	Φ22
A3	Φ13 j6	Φ16 j6	Φ22 j6	Φ32 j6	Φ40 j6	Φ55 j6	Φ65 j6	70	80
A4	35 g6	50 g6	80 g6	110 g6	130 g6	160 g6	225 g6	250	290
A5	M4X0.7P	M5X0.8P	M8X1.25P	M10X1.5P	M12X1.75P	M20X2.5P	M20X2.5P	M20X2.5P	M20X2.5P
A6	5 h9	5 h9	6 h9	10 h9	12 h9	16 h9	18 h9	20	22
A7	15	18	24.5	35	43	59	69	74.5	85
B1	42	65	85	115	142	190	240	285	330
B2	26	32	40	57	86	88	108	132	150
B3	5.5	3	3	4	5	6	6	20	25
B4	19	28	36	52	80	80	100	110	120
B5	16	25	30	45	65	70	90	100	100
B6	4	8	10	15	20	20	25	25	30
B7#	86.5	112	140	193.5	263	308	352	456	520
C1*	46	70	90	145	200	215	265	265	265
C2*	M4X0.7P	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M12X1.75P	M12X1.75P	M12X1.75P	M12X1.75P
C3*	Φ8 F7	Φ14 F7	Φ19 F7	Φ35F7	Φ42 F7	Φ55 F7	Φ60 F7	Φ65F7	Φ65F7
C4*	27	33	45	60	82	82	120	120	120
C5*	30 G7	50 G7	70 G7	110 G7	114.3 G7	180 G7	230 G7	230G7	230G7
C6*	5	5	6	8	8	8	8	8	8
C7*	42	65	85	128	178	198	250	250	250
C8*	15	20	26	43	50	54	54	54	54
C9	10	16	16.5	25	34	35	35	35	35

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。
* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

LTAR 系列性能参数表 /LTAR Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	LTA042	LTA060	LTA090	LTA115	LTA142	LTA190	LTA240
额定输出力矩 Rated output torqueT _{2N}	Nm	1	3	-	20	50	140	310	1050	1600
			4	18	35	90	240	605	1780	3500
			5	16	32	70	240	605	1345	2640
			7	-	-	50	100	320	-	-
			8	9	20	50	90	300	750	1480
			10	7	15	35	90	250	500	-
		2	9	-	25	50	140	340	1050	1840
			12	-	25	50	140	340	1030	1840
			15	-	25	50	140	340	1485	1840
			16	20	40	100	260	680	2035	3710
			20	20	40	100	260	680	2035	3710
			25	20	35	80	260	680	1485	2805
			32	20	40	100	260	680	2035	3710
			40	20	35	80	260	680	2035	2805
			50	20	35	80	260	680	1485	2805
			64	20	20	41	90	300	750	1500
		3	60	-	35	60	260	450	2590	1950
			64	25	44	110	260	680	2590	3950
			80	25	44	110	260	680	2590	3950
			100	25	44	110	260	680	2590	3950
			120	-	25	60	260	450	1450	1950
			125	25	30	90	260	680	1850	3000
			160	25	44	110	260	680	2590	3950
			200	25	40	90	260	680	1855	3950
			250	25	-	-	260	680	1600	3000
			256	20	44	110	-	-	-	-
			280	-	-	-	260	680	-	-
			320	20	40	60	-	-	2590	3950
			350	-	-	-	260	680	-	-
			400	20	-	-	260	680	2590	3950
			500	-	-	-	260	680	1600	3000
			512	-	25	52	-	-	-	-
			1000	-	-	-	260	275	1070	-
急停扭矩 Emergency stop torqueT _{2NOT}	Nm	1,2,3	3-1000	二倍额定输出力矩 /Twice rated output torque						
额定输入转速 Rated input speed η _{1N}	rpm	1,2,3	3-1000	4500	4500	4000	3000	3000	2000	1500
最大输入转速 Maximum input speed η _{1B}		1,2,3	3-1000	6000	6000	6000	6000	4000	3500	3000
精密齿隙 Precision backLTashP1	arcmin	1	3-10	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15
		2	9-64	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18
		3	60-1000	≤ 22	≤ 22	≤ 22	≤ 22	≤ 22	≤ 22	≤ 22
扭转刚性 Torsional rigidity	Nm/ arcmin	1,2,3	3-1000	0.9	1.8	4.4	9.2	26.7	66.7	123.3
容许径向力 Allowable radial force F _{2aB}	N	1,2,3	3-1000	170	265	440	1240	3700	6500	10500
容许轴向力 Allowable axial force F _{2aB}	N	1,2,3	3-1000	140	200	400	1000	3000	5000	8000
使用寿命 Sevice life	hrs	1,2,3	3-1000	20000						
效率 Efficiency	%	1	3-10	≥ 94%						
		2	9-64	≥ 91%						
		3	60-1000	≥ 89%						
重量 Gross weight	kg	1	3-10	1	2.2	5.3	13.9	25.5	42.5	
		2	9-64	1.2	2.5	6.1	16.5	30.5	53.5	71.5
		3	60-1000	1.4	2.9	6.7	19.3	35.5	60.5	78.5
使用温度 Working temperature	°C	1,2,3	3-1000	-10°C ~90°C						
润滑 Lubricating		1,2,3	3-1000	合成润滑油脂 /Synthetic lubricating grease						
防护等级 IP Grade		1,2,3	3-1000	IP65						
安装方向 InstallLTation direction		1,2,3	3-1000	任意方向 /In any direction						
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	3-1000	≤ 60	≤ 62	≤ 65	≤ 65	≤ 68	≤ 70	≤ 72



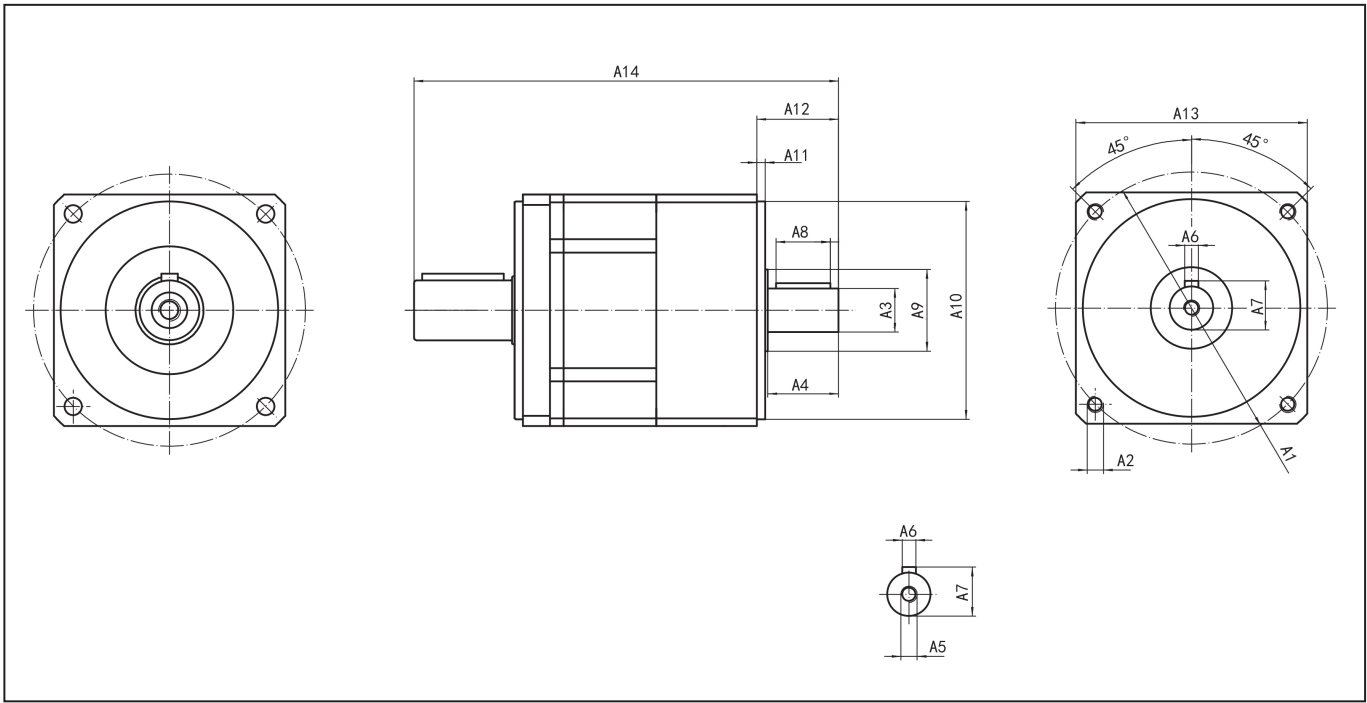
MODEL	LTAR042	LTAR060	LTAR090	LTAR115	LTAR142	LTAR190	LTAR240
A1	50	70	100	130	165	215	265
A2	Φ3.4	Φ5.5	Φ6.5	Φ9	Φ11	Φ13	Φ18
A3	Φ13 h6	Φ16 h6	Φ22 h6	Φ32 h6	Φ40 h6	Φ55 h6	Φ65 h6
A4	35 g6	50 g6	80 g6	110 g6	130 g6	160 g6	225 g6
A5	M4X0.7P	M5X0.8P	M8X1.25P	M10X1.5P	M12X1.75P	M20X2.5P	M20X2.5P
A6	5 h9	5 h9	6 h9	10 h9	12 h9	16 h9	18 h9
A7	15	18	24.5	35	43	59	69
B1	42	65	85	115	142	190	240
B2	26	32	40	55	86	88	108
B3	5.5	3	3	4	5	6	6
B4	19	28	36	52	80	80	100
B5	16	25	30	45	65	70	90
B6	4	8	10	15	20	20	25
B7#	99.5	143.5	181	253	352.5	397	--
C1*	46	70	90	145	145	200	215
C2*	M4X0.7P	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M12X1.75P	M12X1.75P
C3*	Φ8 F7	Φ14 F7	Φ19 F7	Φ35 F7	Φ42 F7	Φ55 F7	Φ55 F7
C4*	27	33	45	60	82	82	82
C5*	30 G7	50 G7	70 G7	110 G7	114.3 G7	180 G7	180 G7
C6*	5	5	6	8	8	8	8
C7*	42	65	85	128	178	198	250
C8*	15	20	26	43	50	54	54
C9	10	16	16.5	25	34	35	35
C10	67	98	129	184	240	256.5	---

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。
* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

LTS 系列性能参数表 /LTAS Series Performance Table

规格 MODEL	单位 Unit	节数 Stage	减速比 Ratio	LTS042	LTS060	LTS090	LTS115	LTS142	LTS190	LTS240	LTS280	LTS330
额定输出力矩 Rated output torqueT _{2N}	Nm	1	3	-	20	50	140	310	1050	1600	-	-
			4	18	35	90	240	605	1780	3500	5800	10190
			5	16	32	70	240	605	1345	2640	4400	7180
			7	-	-	50	100	320	-	-	-	-
			8	9	20	50	90	300	750	1480	2595	4080
			10	7	15	35	90	250	500	-	-	-
		2	9	-	25	50	140	340	1050	1840	-	-
			12	-	25	50	140	340	1030	1840	4400	10000
			15	-	25	50	140	340	1485	1840	5200	8800
			16	20	40	100	260	680	2035	3710	6400	10800
			20	20	40	100	260	680	2035	3710	6400	10800
			25	20	35	80	260	680	1485	2805	4710	7550
			32	20	40	100	260	680	2035	3710	6400	10800
			40	20	35	80	260	680	2035	2805	4710	7550
			50	20	35	80	260	680	1485	2805	-	-
			64	20	20	41	-	-	-	1500	2650	4500
		3	60	-	35	60	260	450	2590	1950	6400	10800
			64	25	44	110	260	680	2590	3950	8130	13700
			80	25	44	110	260	680	2590	3950	8130	13700
			100	25	44	110	260	680	2590	3950	8130	13700
			120	-	25	60	260	450	1450	1950	5800	9800
			125	25	30	90	260	680	1850	3000	6030	9800
			160	25	44	110	260	680	2590	3950	8130	13700
			200	25	40	90	260	680	1855	3950	6030	9800
			250	25	-	-	260	680	1600	3000	6030	8800
			256	20	44	110	-	-	-	-	-	-
			280	-	-	-	260	680	-	-	-	-
			320	20	40	60	-	-	2590	3950	6030	9800
			350	-	-	-	260	680	-	-	-	-
			400	20	-	-	260	680	2590	3950	-	-
			500	-	-	-	260	680	1600	3000	-	-
			512	-	25	52	-	-	-	-	2700	5230
			1000	-	-	-	100	275	1070	-	-	-
急停扭矩 Emergency stop torqueT _{2NOT}	Nm	1,2,3	3-1000	二倍额定输出力矩 /Twice rated output torque								
额定输入转速 Rated input speed η _{1N}	rpm	1,2,3	3-1000	4500	4500	4000	3000	3000	2000	1500	1500	1500
最大输入转速 Maximum input speed η _{1B}		1,2,3	3-1000	6000	6000	6000	6000	4000	3500	3000	3000	3000
精密齿隙 Precision backLTAshP1	arcmin	1	3-10	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 12	≤ 15	≤ 15
		2	9-64	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 18	≤ 18
		3	60-1000	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 18	≤ 22	≤ 22
扭转刚性 Torsional rigidity	Nm/arcmin	1,2,3	3-1000	0.9	1.8	4.4	9.2	26.7	66.7	123.3	213.3	339
容许径向力 Allowable radial force F _{2aB}	N	1,2,3	3-1000	170	265	440	1240	3700	6500	10500	15000	17000
容许轴向力 Allowable axial force F _{2aB}	N	1,2,3	3-1000	140	200	400	1000	3000	5000	8000	12000	15000
使用寿命 Sevice life	hrs	1,2,3	3-1000	20000								
效率 Efficiency	%	1	3-10	≥ 97%								
		2	9-64	≥ 94%								
		3	60-1000	≥ 91%								
重量 Gross weight	kg	1	3-10	0.6	1.2	2.7	9.8	20	36	50	110	160
		2	9-64	0.8	1.5	3.4	12.1	25	48	65	135	180
		3	60-1000	1	1.9	4.1	14.9	30	53	72	145	192
使用温度 Working temperature	°C	1,2,3	3-1000	-10°C ~90°C								
润滑 Lubricating		1,2,3	3-1000	合成润滑油脂 /Synthetic lubricating grease								
防护等级 IP Grade		1,2,3	3-1000	IP65								
安装方向 InstallLTAtion direction		1,2,3	3-1000	任意方向 /In any direction								
噪音值 (n1=3000rpm, 无负载) Noise level (n1=3000rpm,off load)	dB	1,2	3-1000	≤ 57	≤ 62	≤ 65	≤ 65	≤ 67	≤ 68	≤ 70	≤ 73	≤ 75

外形尺寸表 单位: mm Overall dimension table unit: mm



MODEL	LTS060	LTS090	LTS115	LTS142	LTS190	LTS240	LTS280	LTS330
A1#	70	100	130	165	215	265	315	370
A2#	M5	M6	M8	M10	M12	M16	M16	M16
A3#	Φ10 h6	Φ16 h6	Φ20h6	Φ35 h6	Φ40 h6	Φ50 h6	Φ60 h6	Φ70 h6
A4#	21	26	40	58	63	73	80	90
A5#	M3X6	M6X15	M6X15	M10X25	M10X25	M12X20	M10X25	M10X35
A6#	3 h9	5 h9	6 h9	10 h9	12 h9	14 h9	18 h9	20
A7#	11.2	18	22.5	38	43	43	64	74.5
A8#	16	20	30	50	50	60	70	80
A9#	20	30	40	50	50	75	80	90
A10#	50	80	110	130	160	225	250	290
A11#	3	3	4	5	5	8	8	8
A12#	25	30	45	65	70	83	90	100
A13#	65	85	118	150	190	240	285	330
A14	129	156	232	326	352	413	444	526

* 为常用电机尺寸，输入端尺寸根据具体电机尺寸定制，订购以确认图纸为准。

* It is a common motor size. The input size is customized according to the specific motor size. The order shall be subject to the confirmed drawing.

RV 精密减速机

RV precision reducer



RV-E 系列型号表示 /RV-E series model representation

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名称	型号	结构	减速比	输入轴类型
RV	6	主轴内藏	$\frac{1}{R}$	A: 细轴型 B: 粗轴型
	20			
	40			
	80			
	110			
	160			
	320			
	450			

E 系列技术参数表 / E series technical parameters

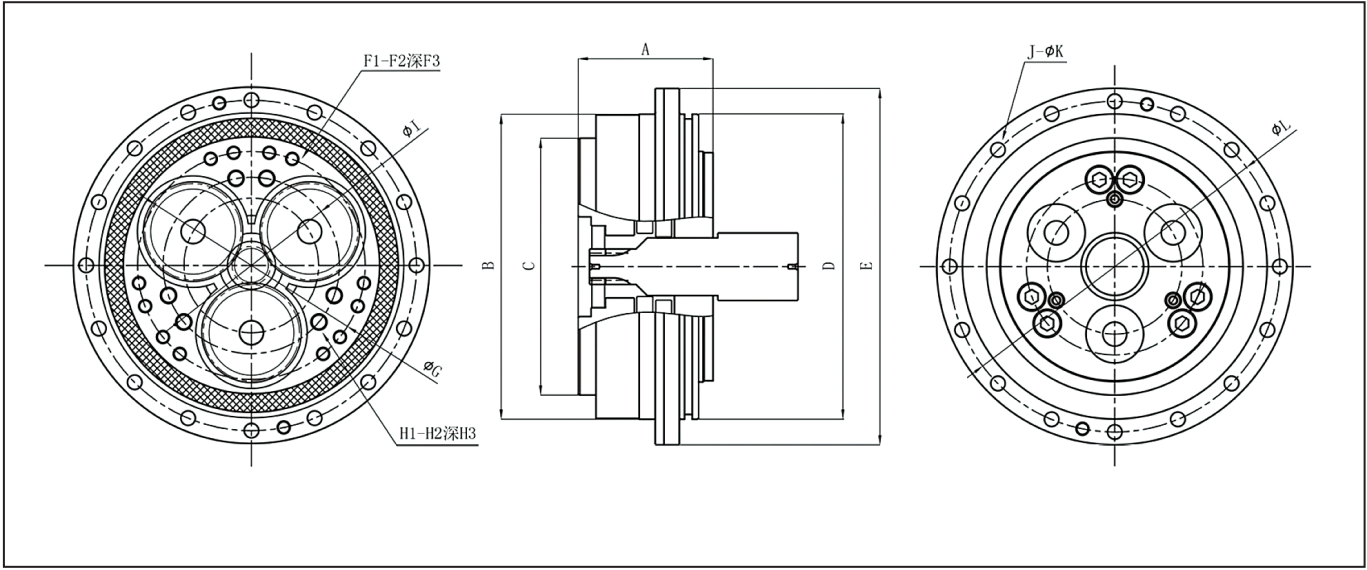
输出转速 型号	5 r/min		15 r/min		25 r/min		35 r/min	
	输出转矩	输入功率	输出转矩	输入功率	输出转矩	输入功率	输出转矩	输入功率
	Nm	kW	Nm	kW	Nm	kW	Nm	kW
6E	101	0.07	72	0.15	62	0.22	58	0.25
20E	243	0.17	180	0.38	152	0.54	137	0.66
40E	560	0.40	400	0.88	355	1.20	330	1.52
80E	1010	0.71	800	1.57	696	2.41	605	2.88
110E	1560	1.10	1100	2.31	940	3.30	855	4.11
160E	2215	1.49	1600	3.41	1358	4.77	1215	5.89
320E	4336	3.10	3200	6.71	2728	9.87		
450E	6210	4.15	4500	8.90	3802	12.9		

注：输出转速 15r/min 时为额定输出扭矩 Note: the rated output torque is when the output speed is 15R / min

型号	减速比		输出转速最大值	齿隙最大值	工作转矩最大值	冲击转矩最大值	工作弯矩最大值	冲击弯矩最大值	重量
	轴转动 (R)	外壳转动	r/min	arc.min	Nm	Nm	Nm	Nm	kg
6E	79	78	75	1.5	117	294	243	486	2.5
	103	102							
	121	120							
20E	57	56	75	1	450	900	880	1760	4.7
	81	80							
	105	104							
	121	120							
	141	140							
40E	161	160	70	1	1000	2000	1600	3200	9.3
	57	56							
	81	80							
	105	104							
	121	120							
80E	153	152	70	1	2000	4000	2050	4100	13.1
	81	30							
	101	100							
	121	120							
	153	152							
110E	81	80	50	1	2750	5500	2840	5680	17.4
	111	110							
	161	160							
160E	81	80	45	1	4000	8000	3840	7680	26.4
	101	100							
	129	128							
	145	144							
	171	170							
320E	101	100	35	1	8000	16000	7000	14000	44.3
	129	128							
	141	140							
	171	170							
	185	184							
450E	201	200	25	1	11250	22500	8500	17000	66.4
	171	170							
	192.4	191.4							



外形尺寸表 单位 : mmOverall dimension table unit: mm



型号	20E	40E	80E	110E	160E	320E	450E
A	65	76	84	92.5	104	125	1 40
øB	124 h7	160 h7	190 h7	208 h7	240 h7	284h7	328h7
øC	105 h6	135 h7	160 h7	182 h7	204 h7	245h7	275h7
ø D	123 h7	160 h7	190 h7	200	230	280	310
øE	145	190	222	244 h7	280 h7	325 h7	370 h7
F1	4	4	12	9	15	18	21
F2	M10	M14	M8	M12	M8	M10	M12
F3	18	20	15	20	15	18	20
øG	72	98	142	1 38	1 80	224	250
H1	2	2	6	3	6	6	6
H2	M10	M14	M10	M12	M16	M16	M16
H3	18	20	20	20	30	32	35
øI	65	85	110	100	1 45	] 72	190
J	16	16	16	12	12	16	24
øK	6.8	9	9	11	13	13	13
øL	135	1 75	206	226	260	304	348

RV-C 系列型号表示 /RV-C series model representation

RV

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120

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C

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36.75

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B

名称	型号	结构	减速比	安装紧固方式
RV	10	中空型	$\frac{1}{R}$	B: 输出轴螺栓紧固型
	27			
	50			
	100			
	120			
	200			
	320			
	400			
	500			

C 系列技术参数表 /C series technical parameters

输出转速 型号	5 r/min		15 r/min		25 r/min		35 r/min	
	输出转矩	输入功率	输出转矩	输入功率	输出转矩	输入功率	输出转矩	输入功率
	Nm	kW	Nm	kW	Nm	kW	Nm	kW
10C	140	0.10	100	0.21	85	0.31	76	0.38
27C	360	0.26	270	0.54	224	0.80	204	1.00
50C	680	0.48	500	1.00	416	1.47	388	1.87
100C	1360	0.95	1000	2.00	834	3.00	765	3.80
120C	1422	1.08	1200	2.22	907	3.12	788	4.00
200C	2700	1.9	2000	4.02	1690	5.79	—	—
320C	4375	3.00	3200	6.47	2674	9.55	—	—
400C	5449	3.79	3920	8.19	—	—	—	—
500C	6811	4.75	4900	10.26	—	—	—	—

型号	单体减速机的速比 (R)	输出最大值	齿隙最大值	工作转矩最大值	冲击转矩最大值	工作弯矩最大值	冲击弯矩最大值	重量
		r/min	arc.min	Nm	Nm	Nm	Nm	
10C	27	80	1	250	500	650	1300	4.6
27C	36.57	60	1	675	1350	945	1890	8.5
50C	32.54	50	1	1250	2500	1750	3500	14.5
100C	36.75	40	1	2500	5000	2500	5000	19.5
120C	36.75	40	1	3000	6000	2500	5000	21
200C	34.86	30	1	5000	10000	8800	17600	55
320C	35.61	25	1	8000	16000	20000	40000	80
400C	35.61	20	1	9800	19600	26460	52920	106
500C	37.34	20	1	12250	24500	34300	78400	154

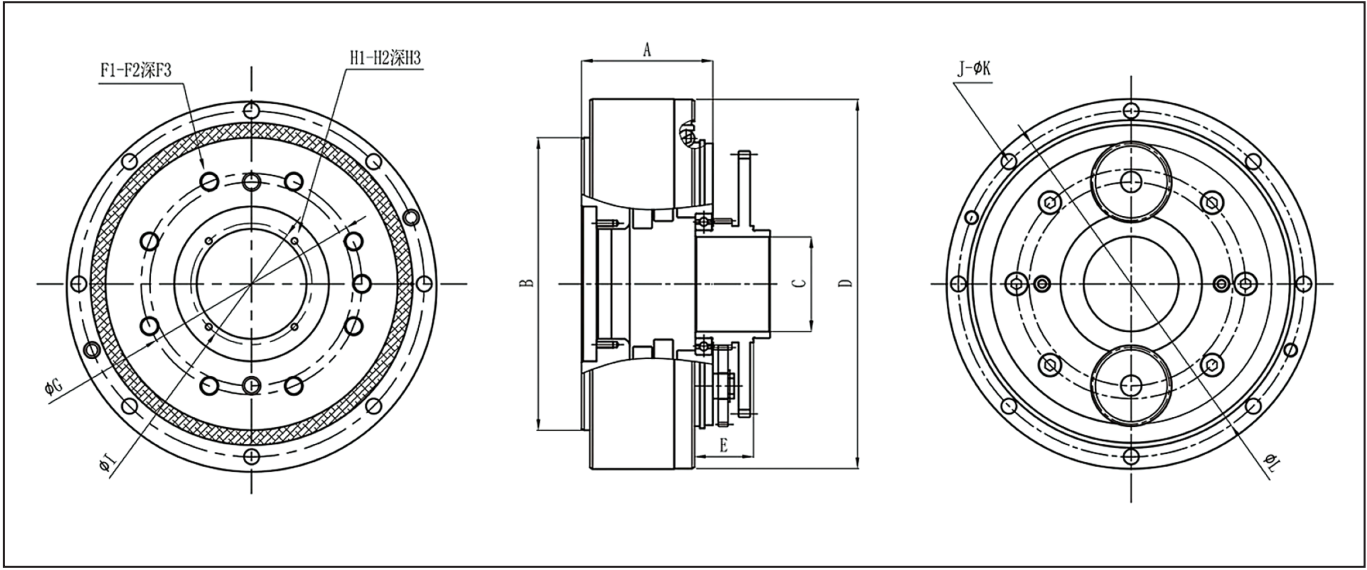
注：输出转速为 15r/min 时，输出转矩为额定转矩。 Note: when the output speed is 15R / min, the output torque is the rated torque.

C 系列减速机中心大齿轮参数表 Parameter table of center big gear of C series reducer

减速机型号	齿轮系数	齿数	变位系数
RV-10C	2	57	0
RV-27C	1.25	78	0
RV-50C	2	78	0
RV-100C	1.75	112	0
RV-120C	1.75	112	0
RV-200C	2	110	0
RV-320C	2	125	0
RV-400C	—	—	—
RV-500C	—	—	—



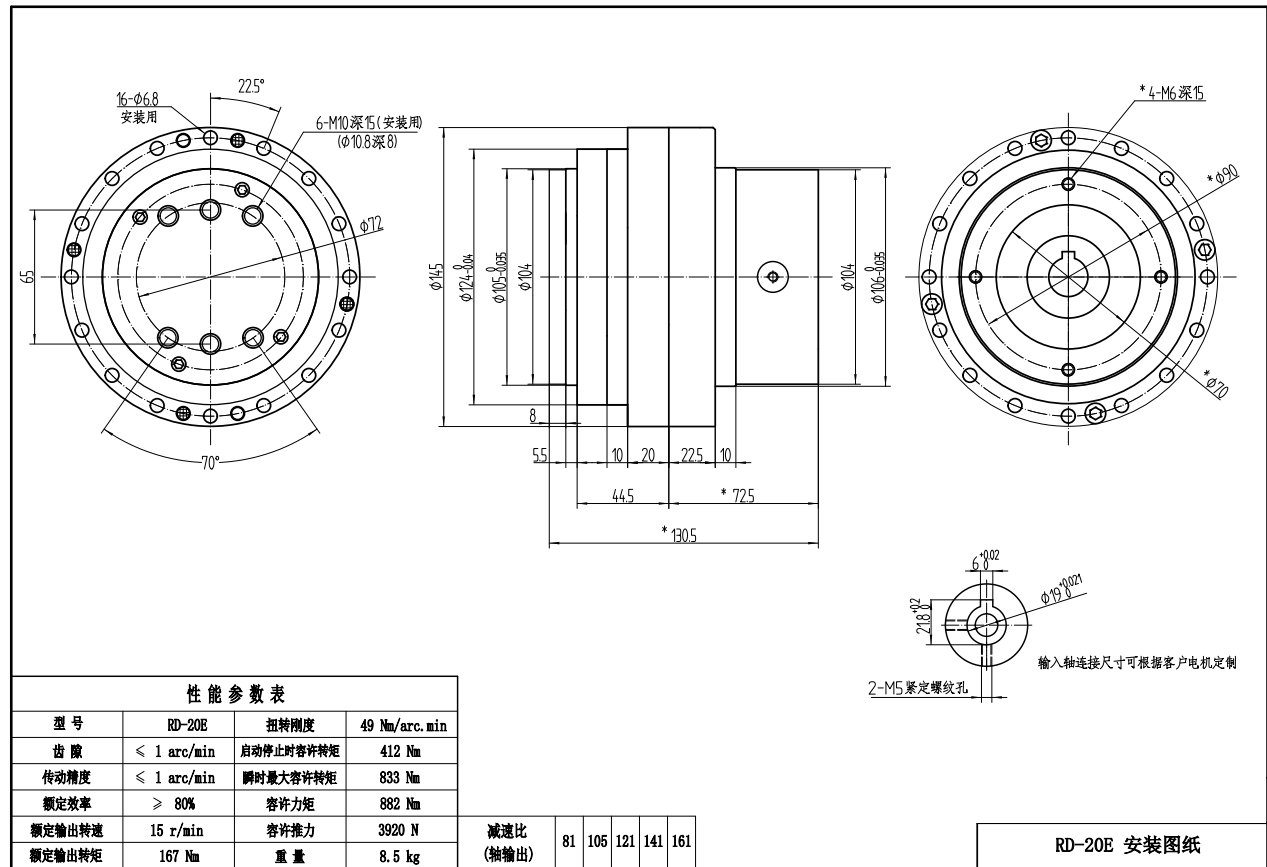
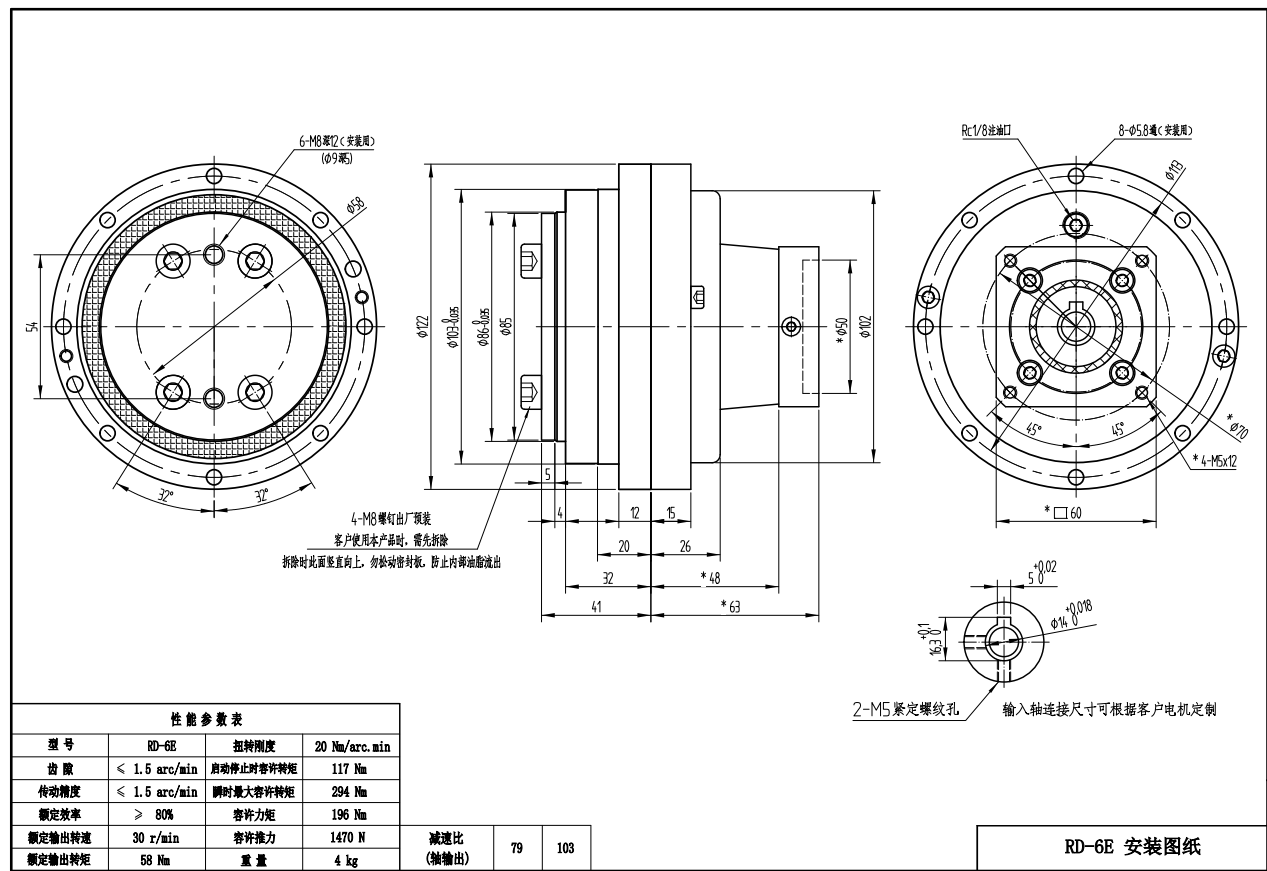
外形尺寸表 单位 : mm Overall dimension table unit: mm



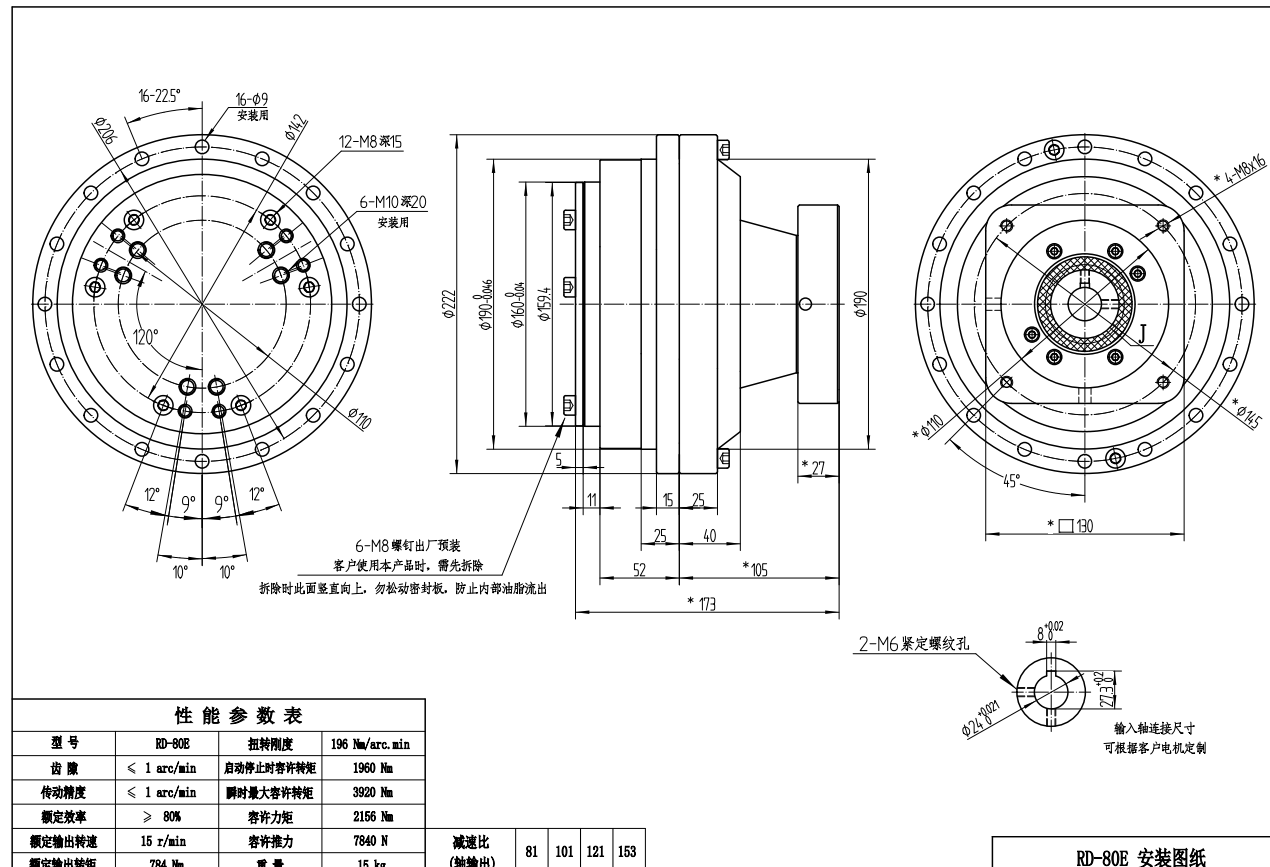
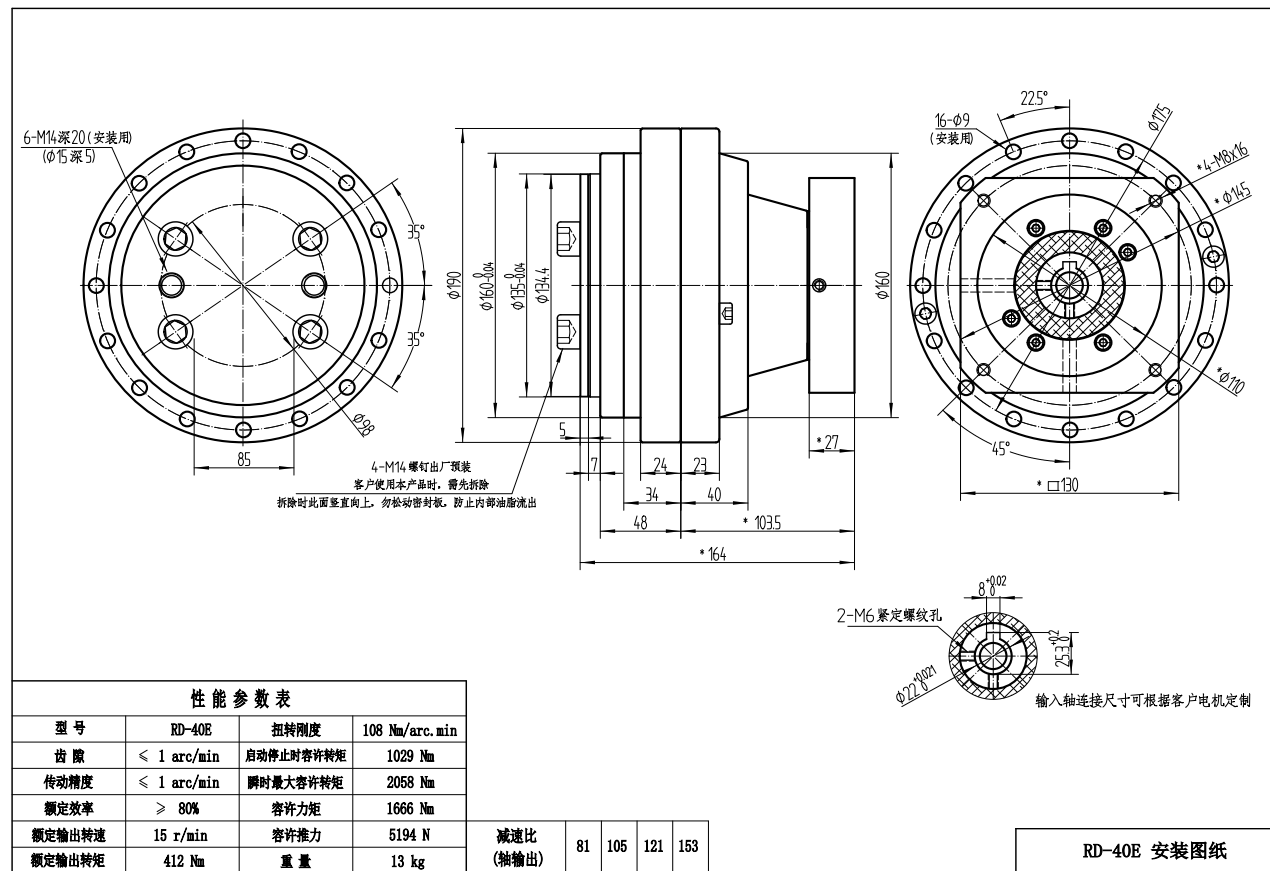
型号	10C	27C	50C	100C	120C	200C	320C	320CA
A	59	67.5	79	82.5	82.5	120.5	126	148.5
øB	110h7	140 h7	176h7	199 h7	199 h7	260 h7	340 h7	360 h7
øC	31	43	57	71	71	90	138	132
øD	146h7	181h7	222 h7	250 h7	250 h7	346 h7	440 h7	450 h7
E	26.35 ± 0.6	31.35 ± 0.65	34.35 ± 0.65	39.35 ± 0.65	39.35 ± 0.65	56.2 ± 0.85	71.75 ± 0.9	—
F1	6	8	9	9	6	9	9	12
F2	M8	M8	M10	M12	Φ15	M16	Φ20	M16
F3	15	18	20	20	—	25	—	25
øG	82	116	133	160	140	194	252	328
H1	4	4	4	6	—	4	4	3
H2	M3	M4	M4	M6	—	M6	M6	M6
H3	8	8	10	10	—	13	10	12
øI	40	56	73	83	—	116	152	144
J	8	12	8	14	14	8	18	16
øK	6.6	6.6	9	11	M10	13	M12	13
øL	134	169	208	233	233	324	415	425



RD-E 系列 /RD-E series

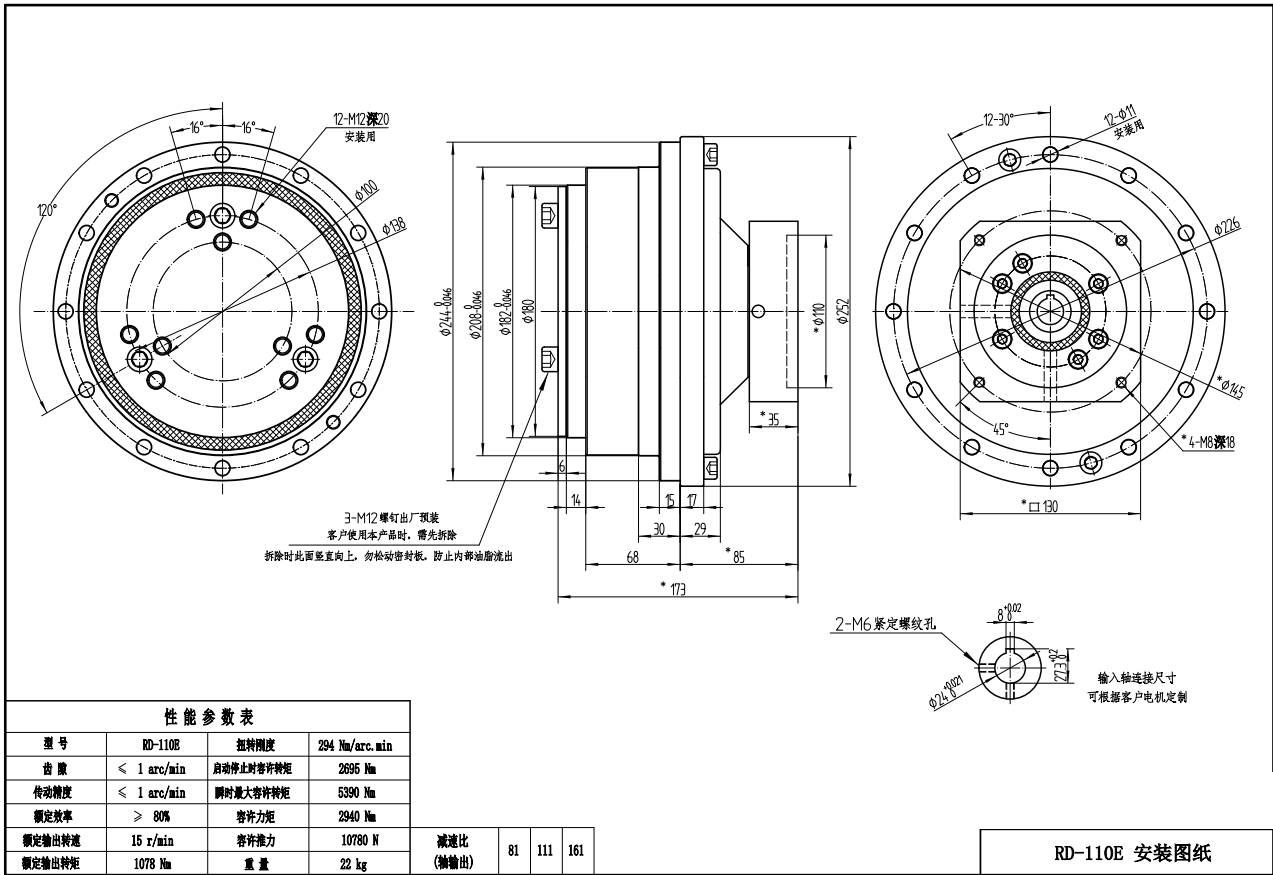


RD-E 系列 /RD-E series

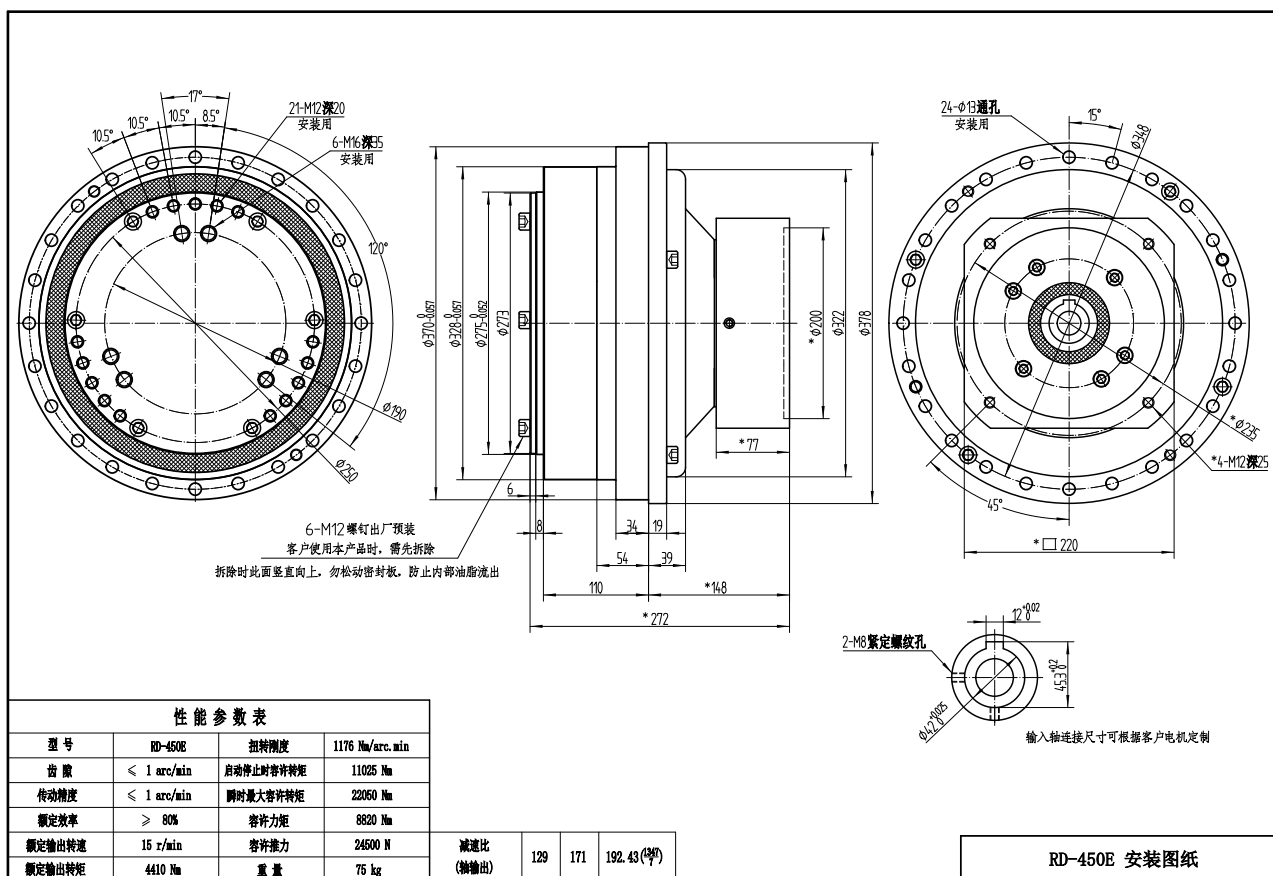
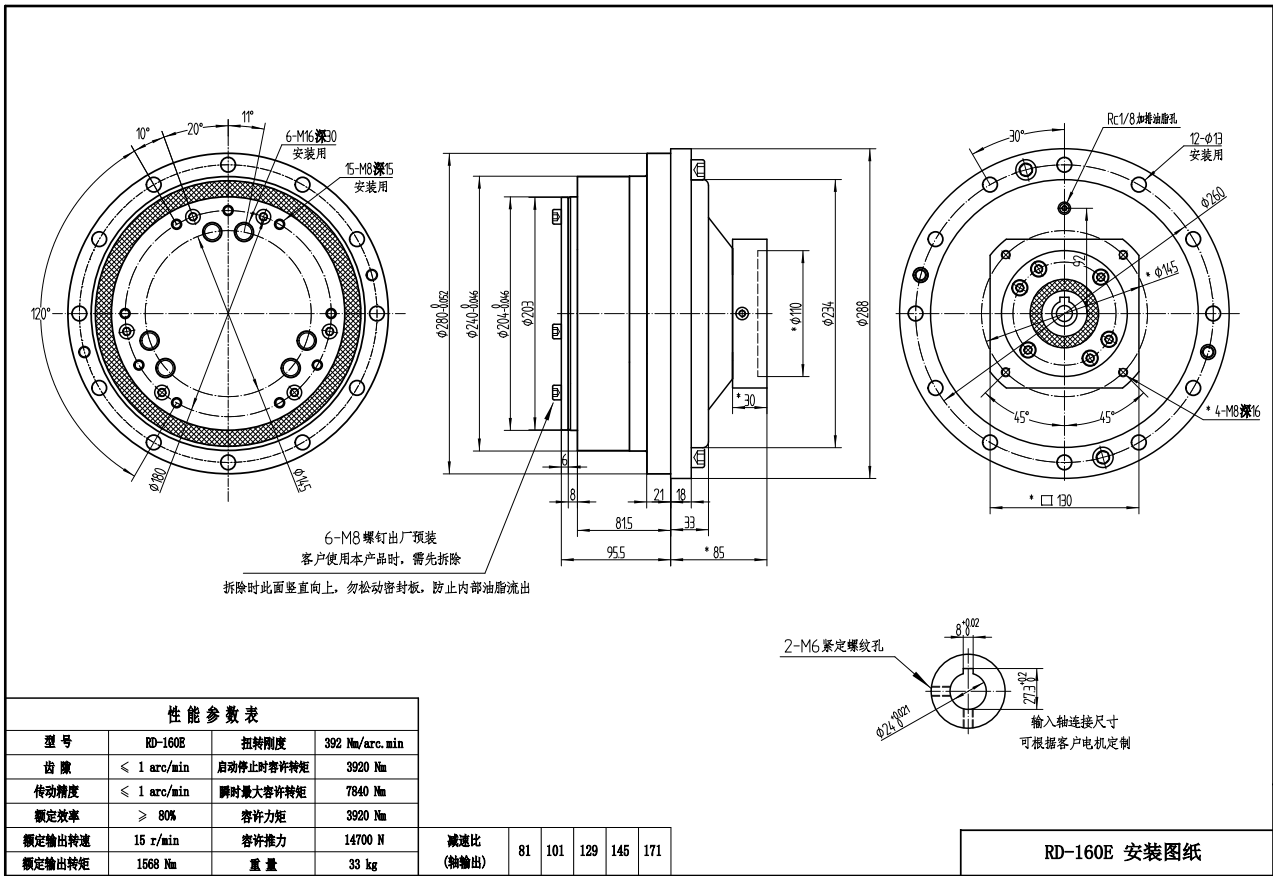
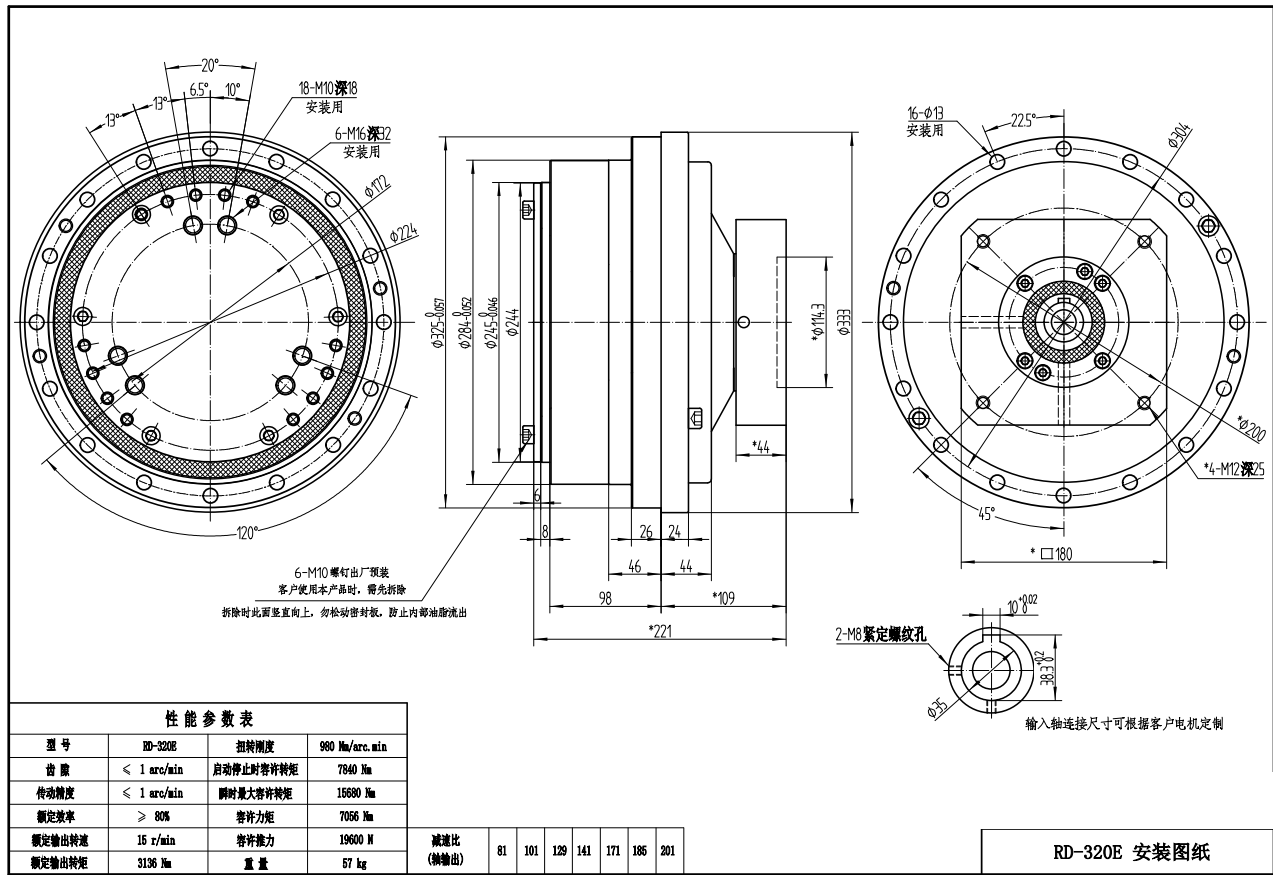


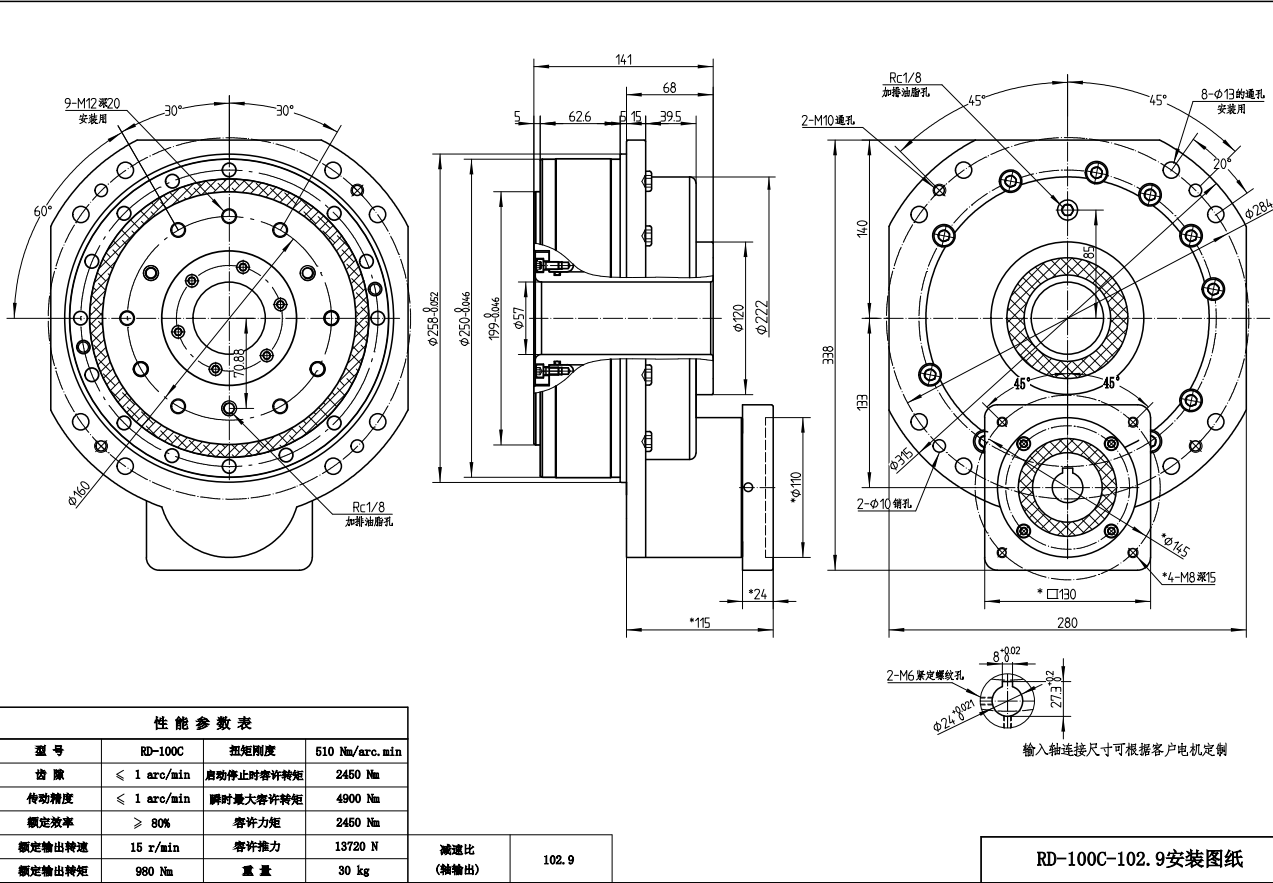
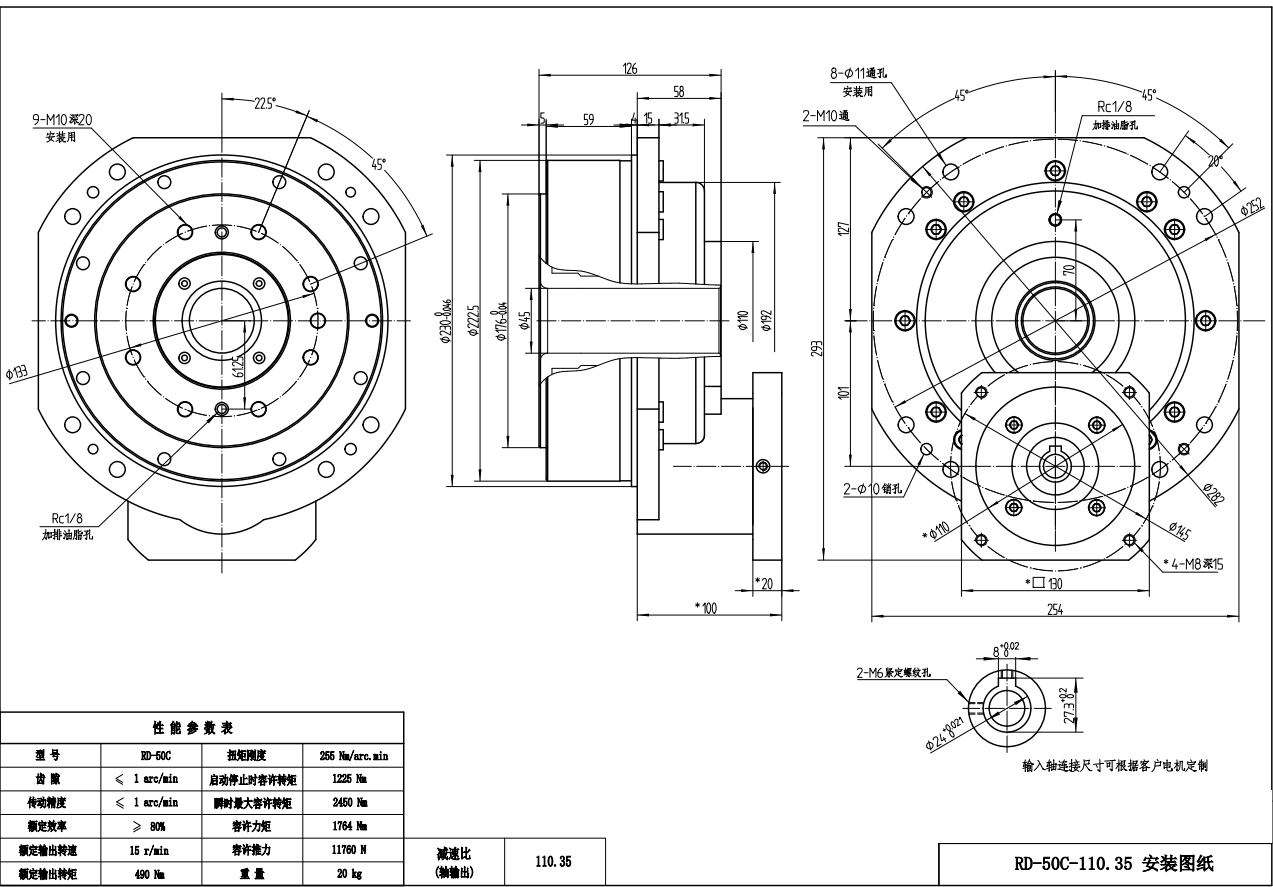
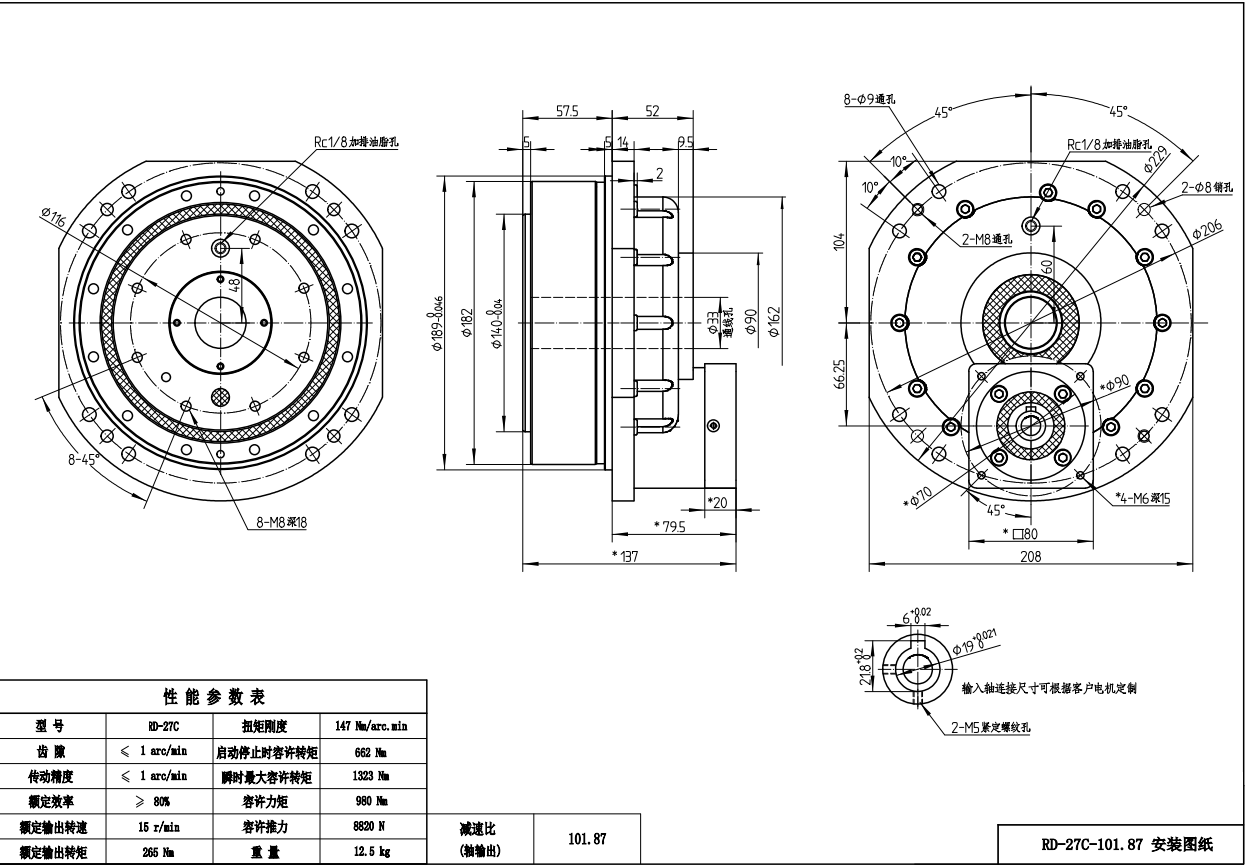
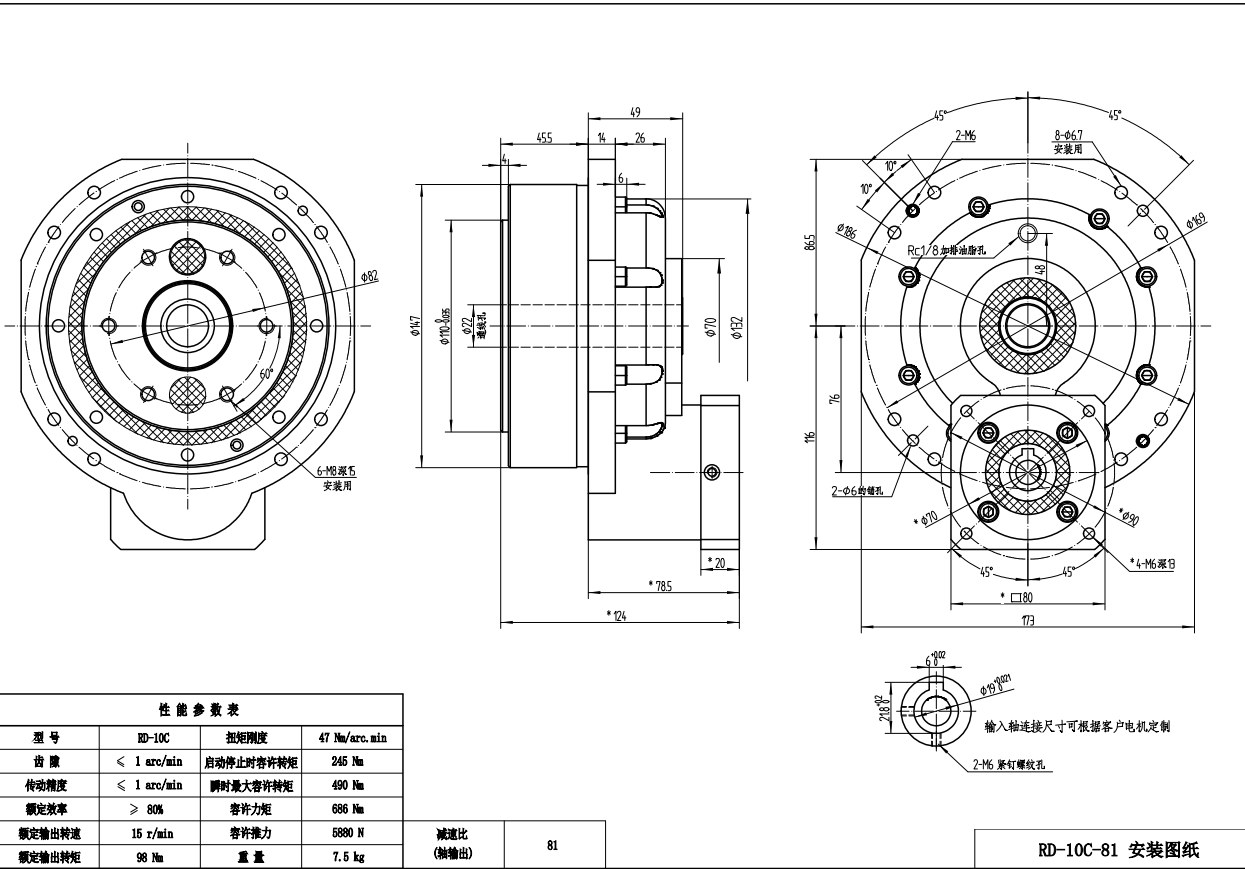


RD-E 系列 /RD-E series



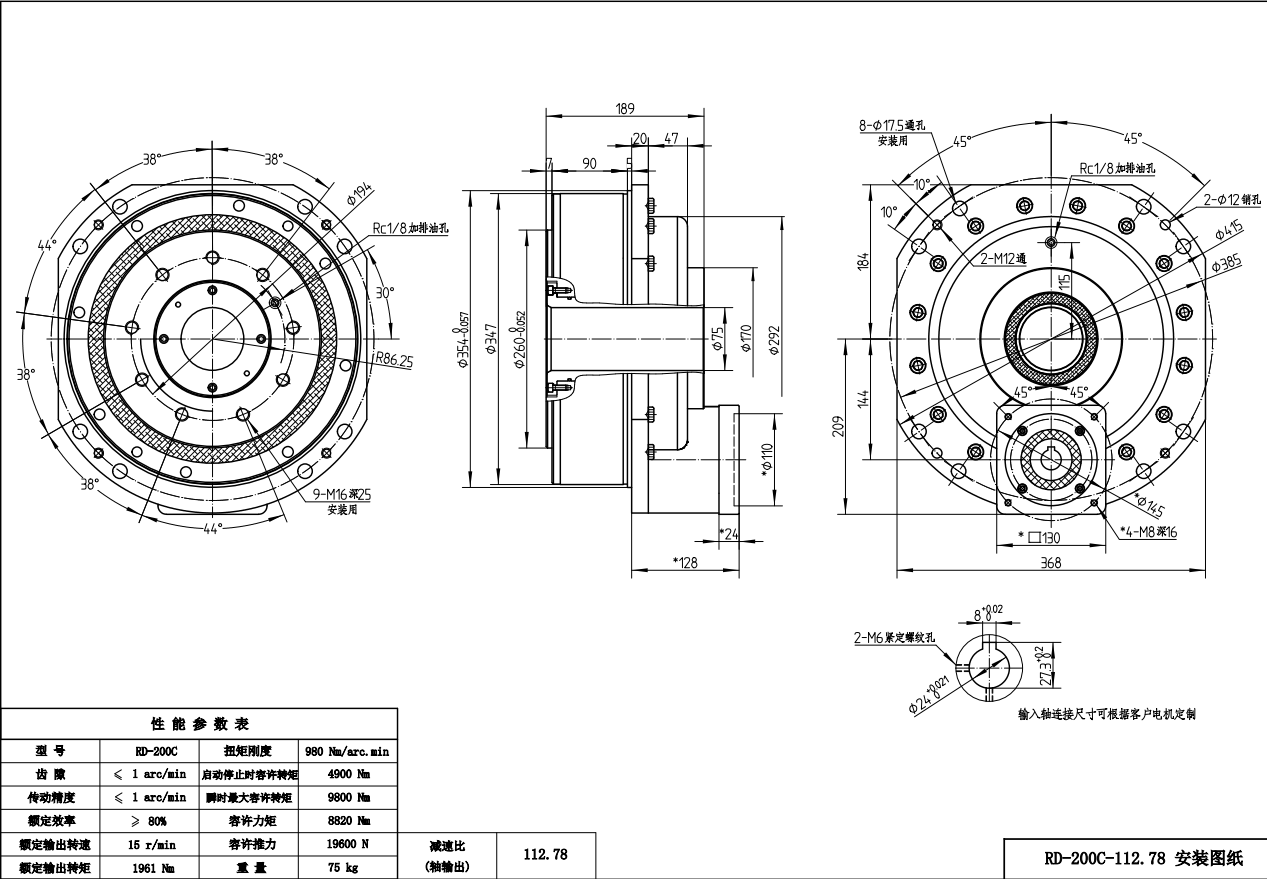
RD-E 系列 /RD-E series



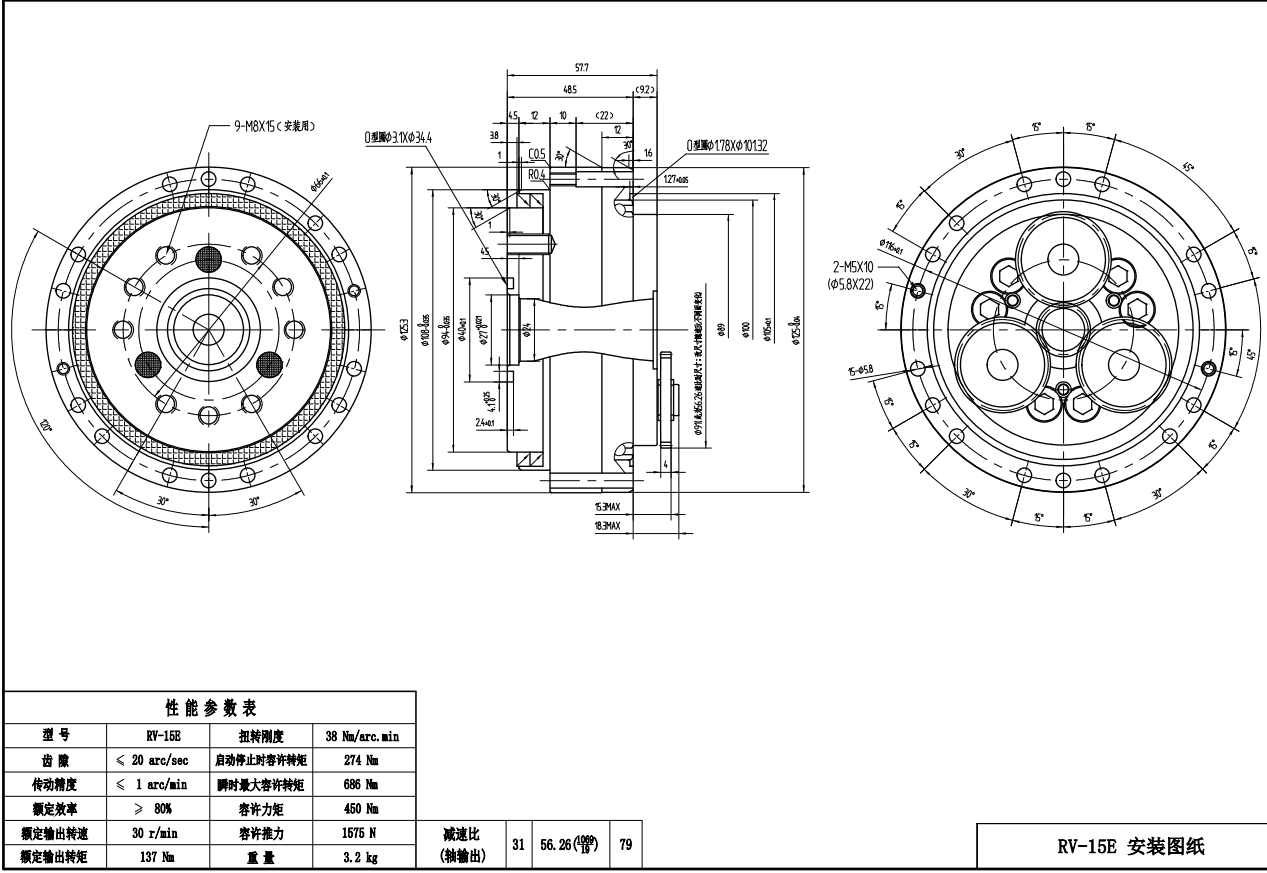
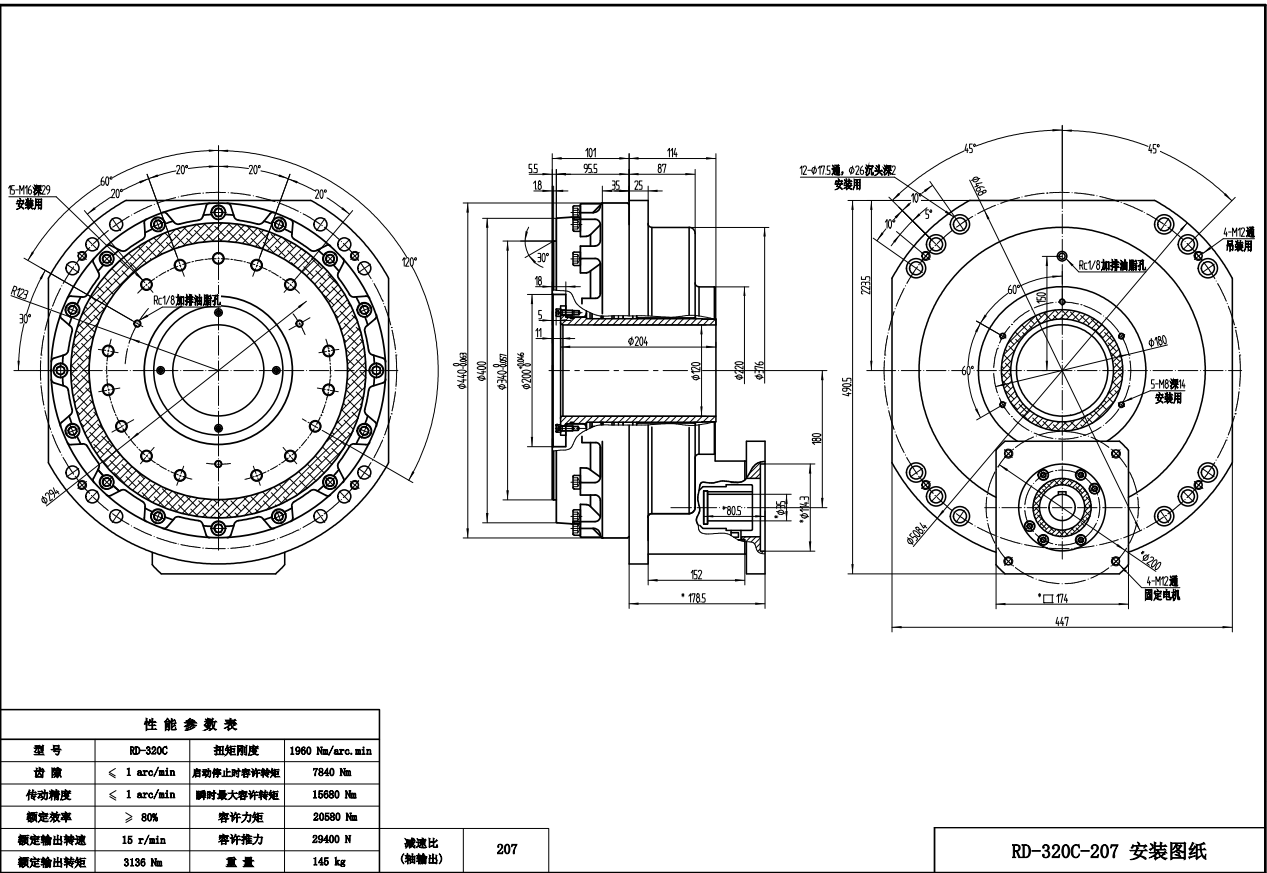
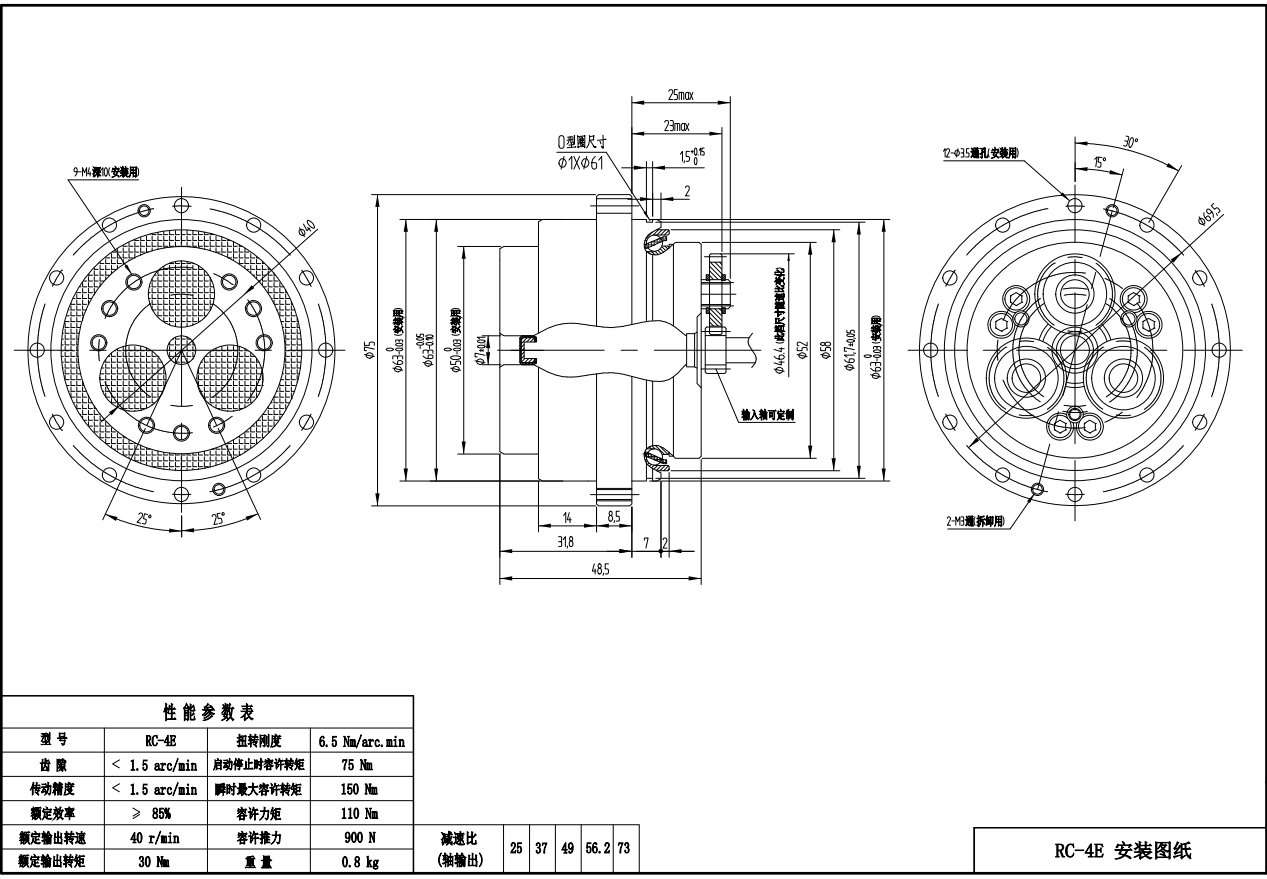




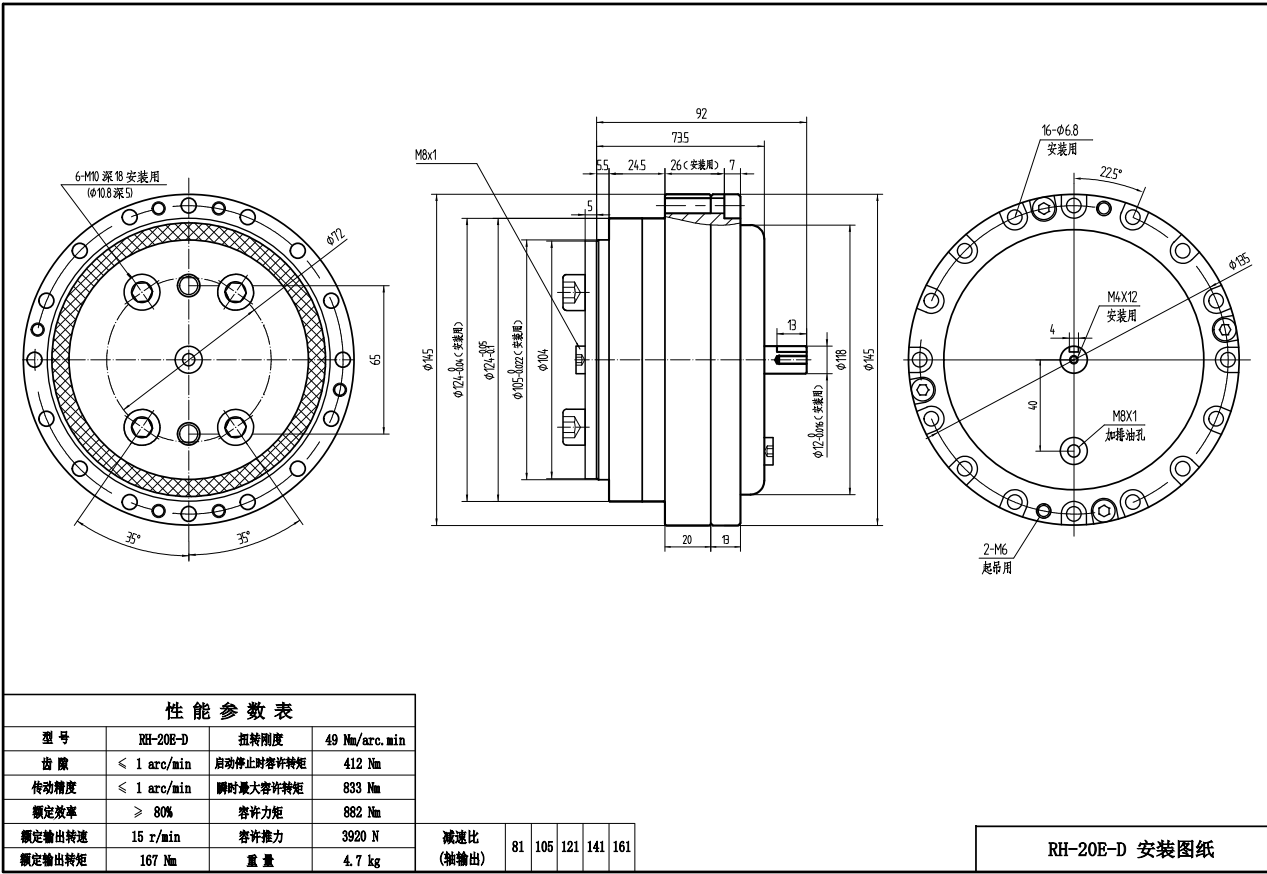
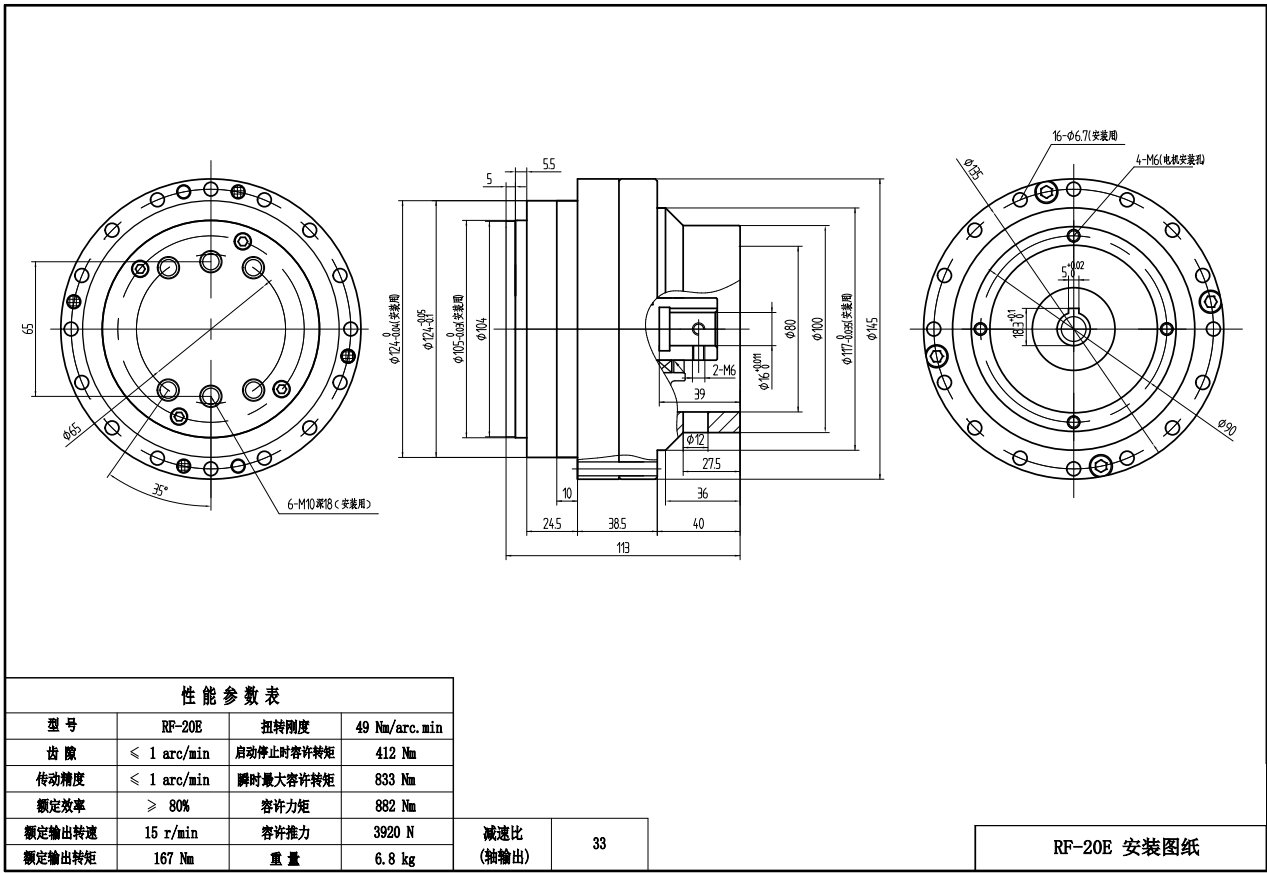
RD-C 系列 /RD-C series



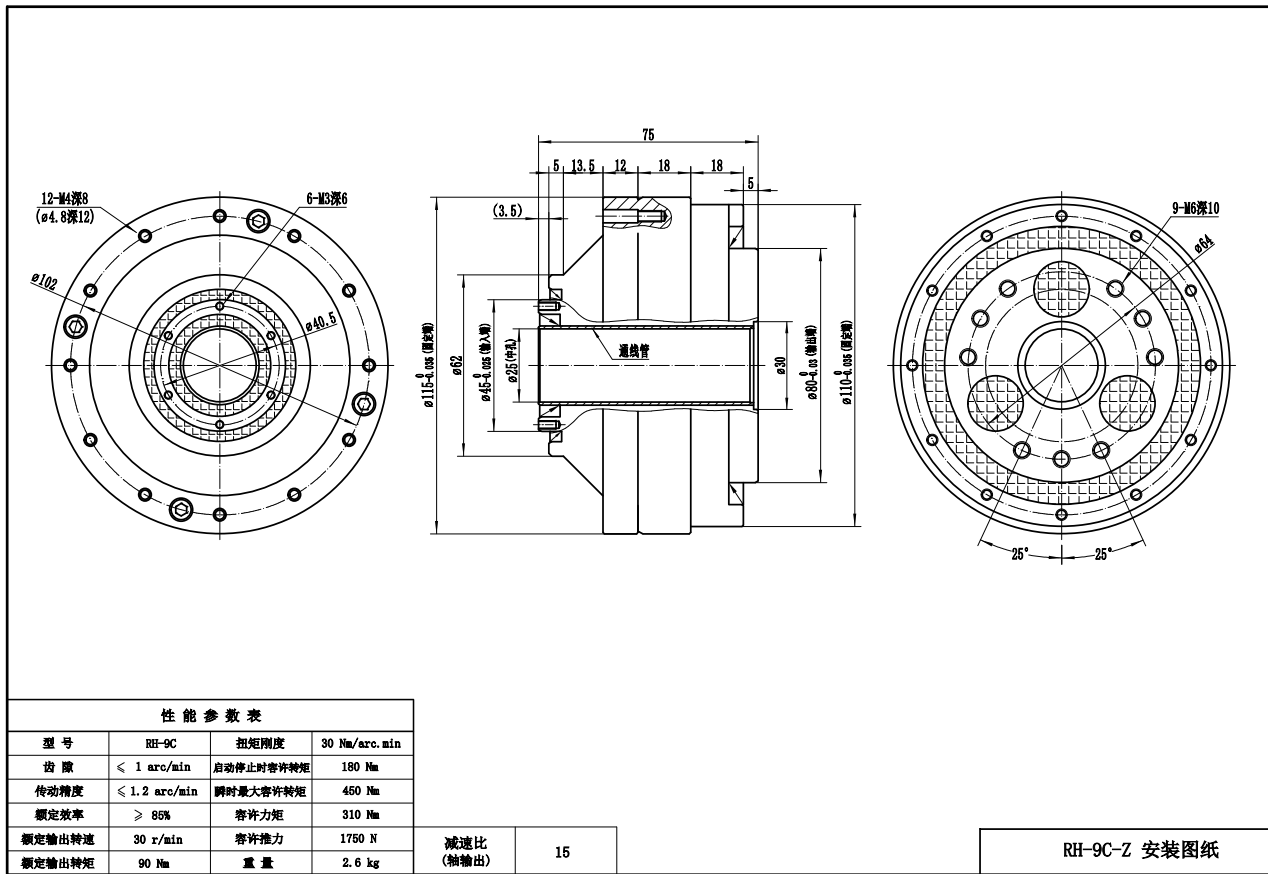
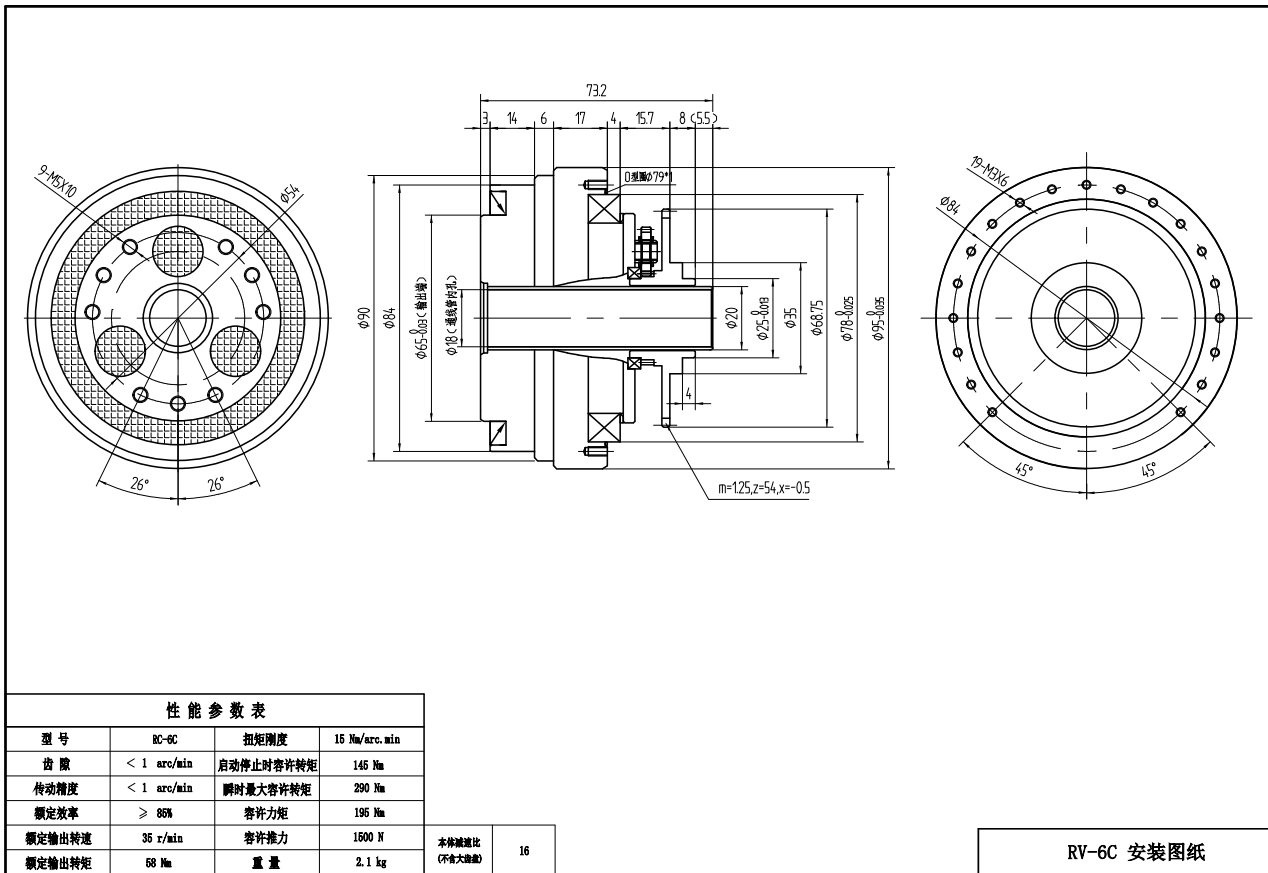
部分非标定制系列 /Some non-standard customized series

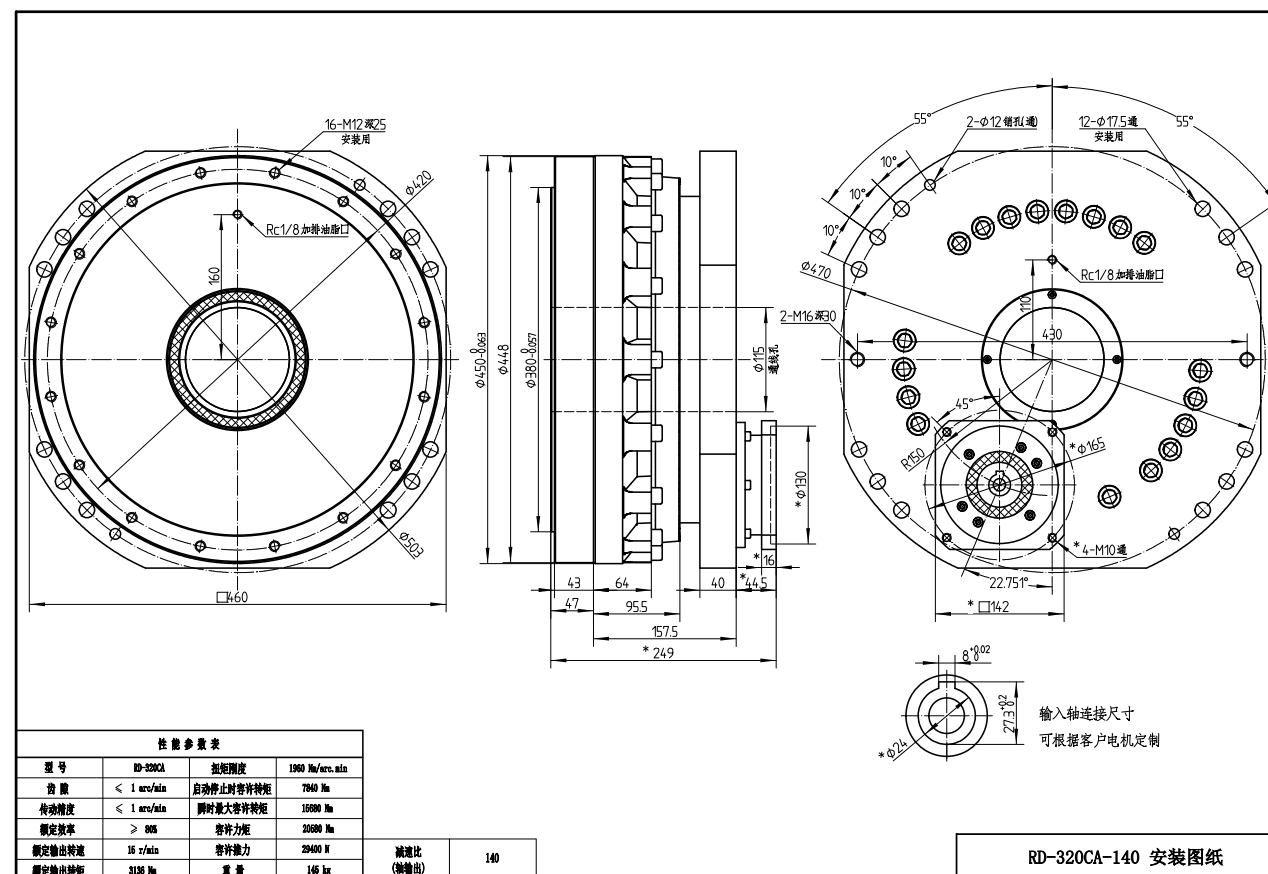
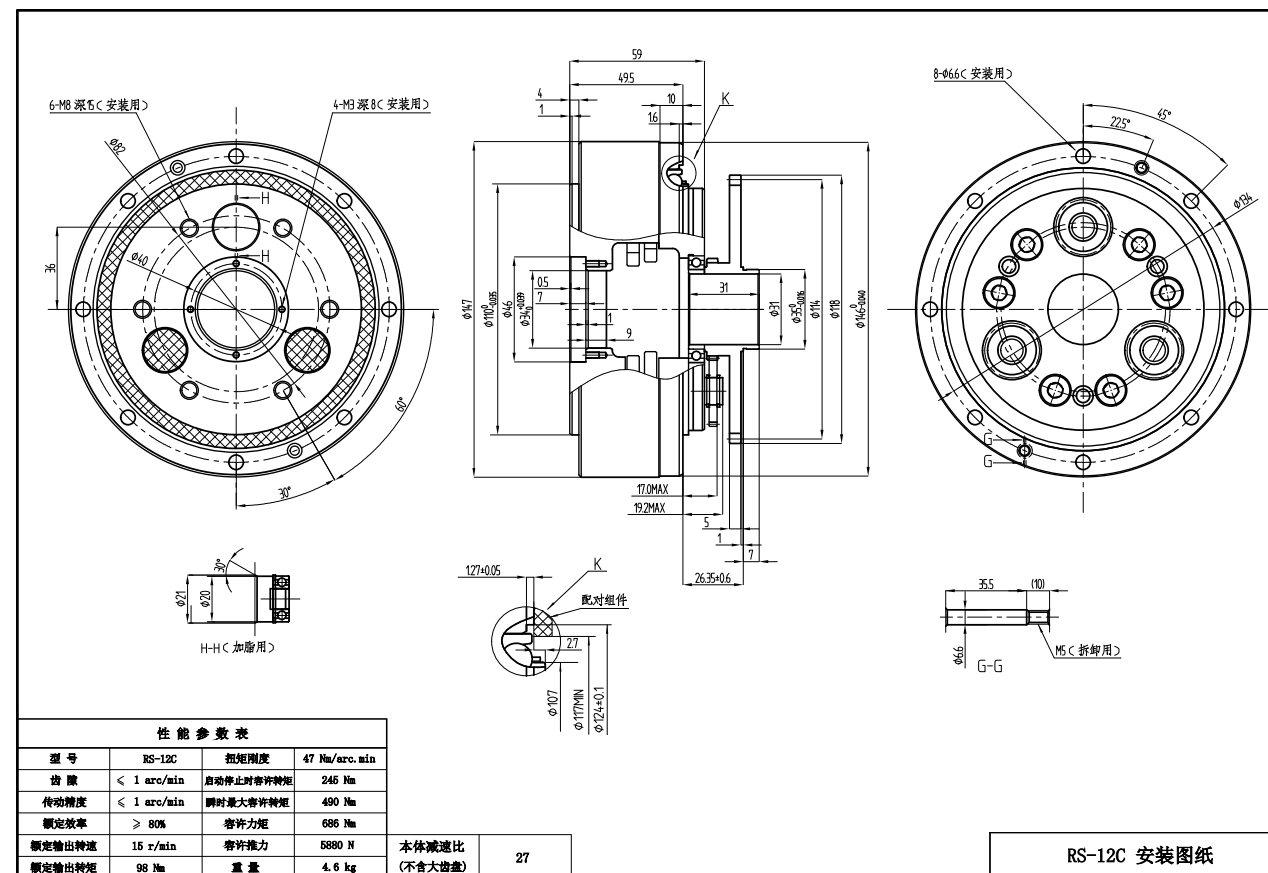


部分非标定制系列 /Some non-standard customized series



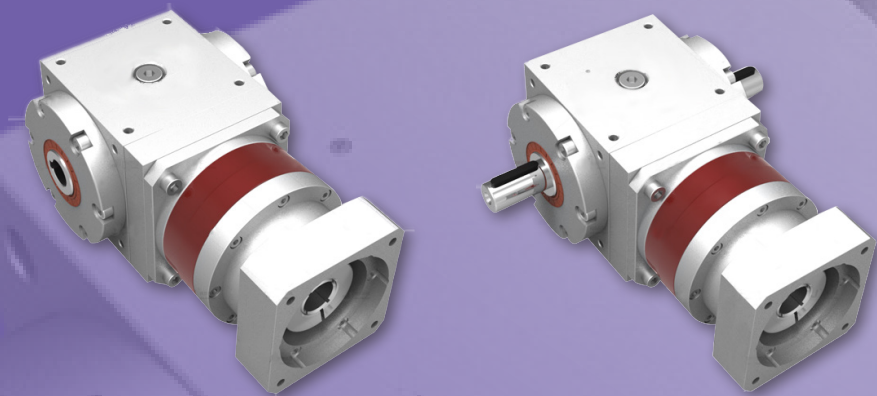
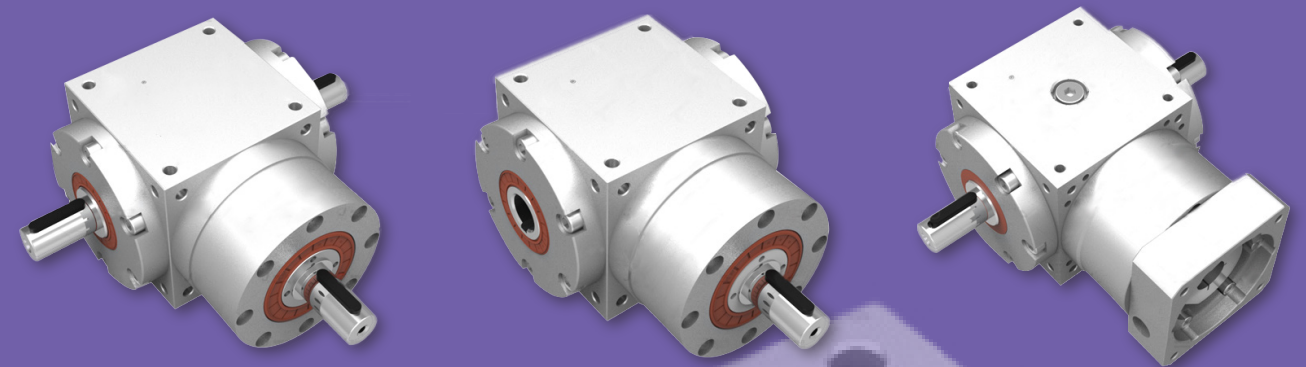
部分非标定制系列 /Some non-standard customized series





螺旋伞齿轮减速机

Spiral bevel gear reducer



HT210/ HTB210

FL1

200

S1

马达

减速机型号

HT065, HT075, HT090, HT110, HT140, HT170, HT210, HT240, HT280
HTB065, HTB075, HTB090, HTB110, HTB140, HTB170, HTB210, HTB240, HTB280

比数

1 Stage:1, 1.5,2,3, 4, 5
2 Stage: 7, 10, 15, 20, 25, 35, 50
3 Stage: 75, 100, 125, 150, 200, 250, 350, 500

马达类型

马达制造商及型号

减速机

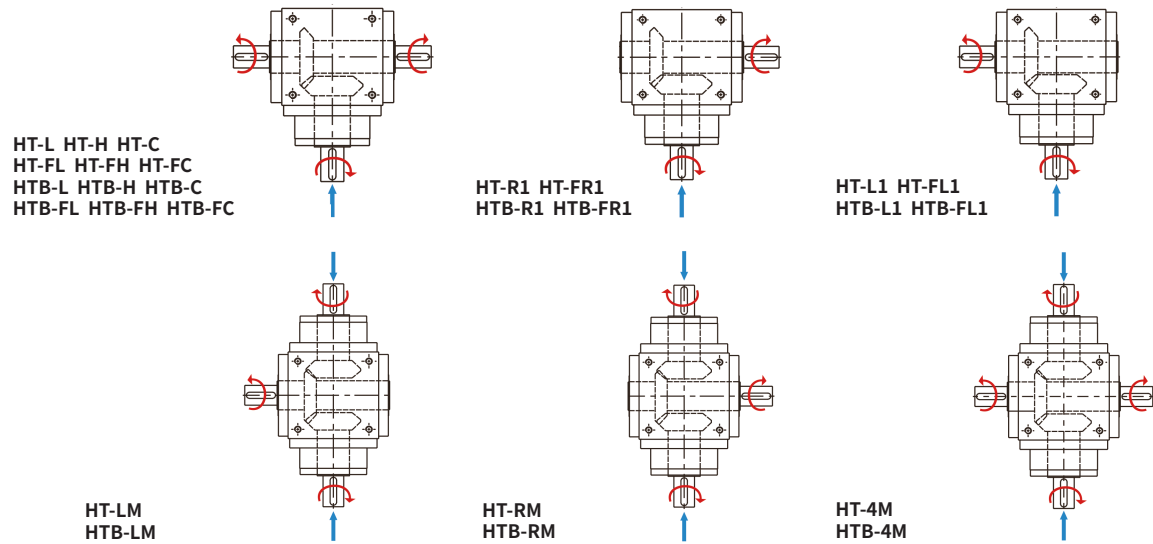
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FR1/FR1M1/FR1M2/FH/FHM1/FHM2/
FC/ FCM1 / FCM2

输出轴型式选择

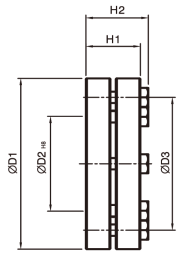
S1: 平滑直轴 .
S2: 附键直轴

选用范例： HT210-FL1-200-S1/SIEMENS 1FK6 032-6AK71
HTB210-FL1-200-S1/SIEMENS 1FK6 032-6AK71

HT/ HTB 系列的旋转方向 Rotation direction of HT / HTB series



缩紧盘附件选配 Shrink disc accessories optional

	C/FC 系列	D1	D2	D3	H1	H2
	SSD-d16xdw14	41	16	26	15	18.5
	SSD-d22xdw18	50	22	36	19.5	23
	SSD-d25xdw22	50	25	38	19.5	23
	SSD-d44xdw32	80	44	61	25.5	29.5
	SSD-d50xdw40	90	50	70	27.5	31.5
	SSD-d62xdw50	110	62	86	30.5	34.5
	SSD-d68xdw55	115	68	86	30.5	34.5
	SSD-d75xdw60	138	75	100	32.5	38

HT/ HTB 轴型

性能参数表（HTB 系列的性能，规范与 HT 系列相同）

Table of performance parameters (performance specification of HTB series is the same as that of HT series)

规格 Model	单位 Unit	节数 Stage	减速比 Ratio	HT065 L HT065 L1 HT065 H HT065 C HT065 R1 HT065 LM HT065 RM HT065 4M	HT075 L HT075 L1 HT075 H HT075 C HT075 R1 HT075 LM HT075 RM HT075 4M	HT090 L HT090 L1 HT090 H HT090 C HT090 R1 HT090 LM HT090 RM HT090 4M	HT110 L HT110 L1 HT110 H HT110 C HT110 R1 HT110 LM HT110 RM HT110 4M	HT140 L HT140 L1 HT140 H HT140 C HT140 R1 HT140 LM HT140 RM HT140 4M	HT170 L HT170 L1 HT170 H HT170 C HT170 R1 HT170 LM HT170 RM HT170 4M	HT210 L HT210 L1 HT210 H HT210 C HT210 R1 HT210 LM HT210 RM HT210 4M	HT240 L HT240 L1 HT240 H HT240 C HT240 R1 HT240 LM HT240 RM HT240 4M	HT280 L HT280 L1 HT280 H HT280 C HT280 R1 HT280 LM HT280 RM HT280 4M
额定输出力矩 Rated output torque T2N	Nm	1	1	25	45	78	150	360	585	1,300	2,150	3,200
			1.5	25	45	78	150	360	585	1,300	2,150	3,200
			2	24	42	68	150	330	544	1,220	2,010	3,050
			3	18	33	54	120	270	450	1,020	1,650	2,850
			4	13	28	48	100	224	376	860	1,410	2,300
			5	12	25	40	85	196	320	740	1,210	2,000
最大加速力矩 T2B	Nm	1	1~5	1.5 倍额定输出力矩 1.5 times rated output torque								
最大加速输入转速 n1B	rpm	1	1~5	7,500	6,500	5,500	4,500	3,500	3,000	2,200	2,000	1,700
齿隙	arcmin	1	1~5	≤ 8	≤ 8	≤ 8	≤ 8	≤ 8	≤ 10	≤ 10	≤ 10	≤ 10
容许径向力 F1rBC 输出轴 d1	N	1	1~5	700	950	1,450	2,100	2,700	3,800	7,800	9,600	10,500
容许径向力 F2rBD 输出轴 d2	N	1	1~5	900	1,100	1,700	2,700	4,800	6,600	11,500	16,000	18,000
容许轴向力 F1aBC 输出轴 d1	N	1	1~5	350	425	725	1,050	1,350	1,900	3,900	4,800	5,250
容许轴向力 F2aBD 输出轴 d2	N	1	1~5	450	550	850	1,350	2,400	3,300	5,750	8,500	9,000
使用寿命 E	hr	1	1~5	20,000								
效率 η	%	1	1~5	≥ 94%								
使用温度	°C	1	1~5	-10°C ~ 90°C								
润滑				合成润滑脂 Synthetic grease								
噪音值 (n =1500rpm, 无负载) F	dB	1	1~5	≤ 68	≤ 70	≤ 74	≤ 76	≤ 77	≤ 78	≤ 80	≤ 82	≤ 83

减速机转动惯量（HTB 系列的性能，规范与 HT 系列相同）

Moment of inertia of reducer (the performance of HTB series is the same as that of HT series)

规格 Model	单位 Unit	节数 Stage	减速比 Ratio	HT065 L HT065 L1 HT065 H HT065 C HT065 R1 HT065 LM HT065 RM HT065 4M	HT075 L HT075 L1 HT075 H HT075 C HT075 R1 HT075 LM HT075 RM HT075 4M	HT090 L HT090 L1 HT090 H HT090 C HT090 R1 HT090 LM HT090 RM HT090 4M	HT110 L HT110 L1 HT110 H HT110 C HT110 R1 HT110 LM HT110 RM HT110 4M	HT140 L HT140 L1 HT140 H HT140 C HT140 R1 HT140 LM HT140 RM HT140 4M	HT170 L HT170 L1 HT170 H HT170 C HT170 R1 HT170 LM HT170 RM HT170 4M	HT210 L HT210 L1 HT210 H HT210 C HT210 R1 HT210 LM HT210 RM HT210 4M	HT240 L HT240 L1 HT240 H HT240 C HT240 R1 HT240 LM HT240 RM HT240 4M	HT280 L HT280 L1 HT280 H HT280 C HT280 R1 HT280 LM HT280 RM HT280 4M
转动惯量 J1	Kg.cm2	1	1	0.15	1.30	3.16	7.70	23.57	58.99	195.40	369.34	799.12
			1.5	0.64	1.16	2.82	6.74	19.37	49.28	155.45	283.58	595.78
			2	0.44	1.11	2.70	6.31	17.75	45.35	140.24	249.74	511.76
			3	0.43	1.09	2.66	6.17	17.18	44.01	134.95	237.71	483.06
			4	0.43	1.09	2.65	6.13	17.06	43.70	133.58	234.72	475.26
			5	0.43	1.09	2.65	6.12	17.02	43.60	133.14	233.67	473.58

重量 WEIGHT

规格 Model	单位 Unit	节数 Stage	减速比 Ratio	HT065	HT075	HT090	HT110	HT140	HT170	HT210	HT240	HT280
L 系列	kg	1	1~5	2.6	4.2	6.8	11.6	19.8	34.8	66.2	98.1	155.7
L1 系列			1~5	2.6	4.1	6.7	11.5	19.5	34.2	65.1	96.6	153.4
H 系列			1~5	2.5	3.9	6.4	11.0	18.1	31.6	60.0	89.4	143.4
C 系列			1~5	2.8	4.2	6.9	11.4	19.6	33.7	63.3	97.9	149.1
R1 系列			1~5	2.6	4.1	6.7	11.5	19.5	34.2	65.1	96.6	153.4
LM 系列			1	3.5	5.6	9.0	15.2	24.1	42.4	81.4	122.0	190.9
RM 系列			1	3.5	5.6	9.0	15.2	24.1	42.4	81.4	122.0	190.9
4M 系列			1	3.5	5.6	9.1	15.4	24.8	42.6	82.5	123.5	193.3

A. 比数 (i=Nin/Nout) : HT-LM/RM/4M 只提供 1:1 比数

B. 齿隙值是在 2% 额定力矩 T2N 的扭力下测得。

C. 最大加速输入转速 n1B 作用于输入轴中心位置。

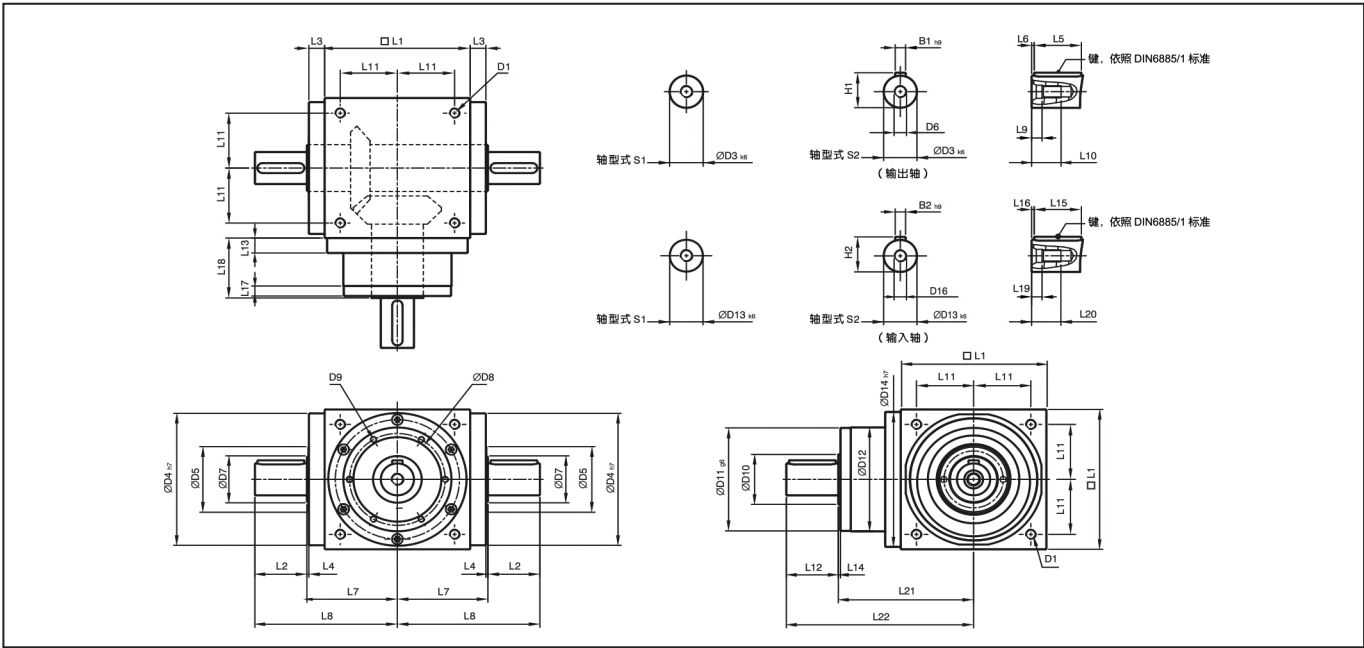
D. 最大加速输出转速 n1B 作用于输入轴中心位置。

E. 连续运转使用寿命为 10,000 小时。

F. 噪音值将会随减速比及高转速而升高。



HT-HTB-L（单节，减速比 i=1~5）（single section, reduction ratio i = 1 ~ 5）

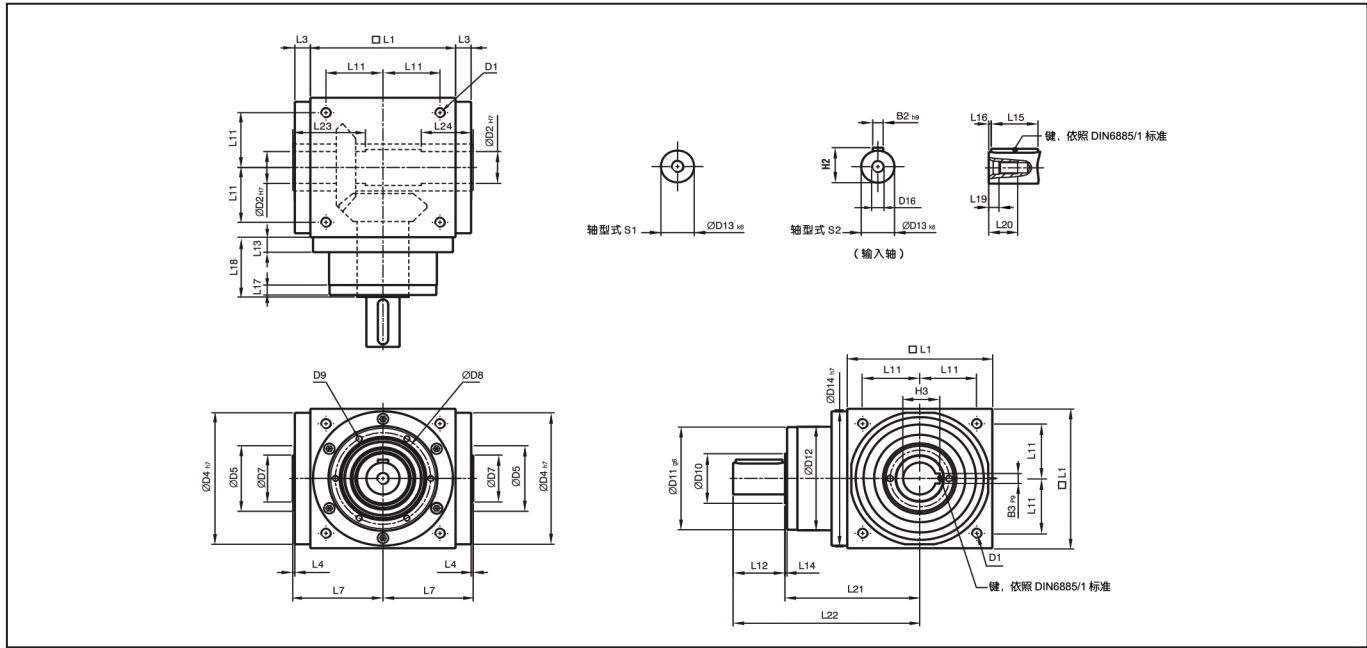


*HTB 系列的尺寸与 HT 系列相同。（单位：mm） *The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065L	HT075L	HT090L	HT110L	HT140L	HT170L	HT210L	HT240L	HT280L
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D3 ^{k6}	13	16	18	22	32	40	50	55	60
D4 ^{h7}	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D6	M4	M5	M5	M8	M12	M16	M16	M16	M20
D7	21	22	28	33	47	55	75	85	110
D8	53	62	76	95	92	114	142	160	176
D9	4xM4xL7	4xM5xL8	4xM5xL8	6xM6xL10	6xM6xL10	6xM8xL12.5	6xM8xL12.5	6xM8xL12.5	6xM10xL15
D10	15.4	20.4	25.8	35.8	49.8	59.3	79.3	92.3	102.3
D11 ^{k6}	62.9	72.9	87	107	103	127	158	178	198
D12	62	72	86	106	104	128	160	180	200
D13 ^{k6}	13	16	18	22	32	40	50	55	60
D14 ^{h7}	63	73	88	108	135	165	205	235	275
D16	M4	M5	M5	M8	M12	M16	M16	M16	M20
L1	65	75	90	110	140	170	210	240	280
L2	19.5	30	35	40	50	60	75	85	110
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70	80	100
L6	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L7	47.5	54	62	72	87	102	127	147	167
L8	67	84	97	112	137	162	202	232	277
L9	4.5	4.8	4.8	7.2	10	12	12	12	15
L10	10	12.5	12.5	19	28	36	36	36	42
L11	27	30	36	44	55	67	85	95	110
L12	19.5	30	35	40	50	60	75	85	110
L13	13	15	15	15	15	15	20	25	25
L14	2	2	2	2	2	2	2	2	2
L15	16	25	28	32	45	50	70	80	100
L16	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L17	6	8	8	8	10	10	10	10	10
L18	43	52.5	55	60	60	70	90	105	120
L19	4.5	4.8	4.8	7.2	10	12	12	12	15
L20	10	12.5	12.5	19	28	36	36	36	42
L21	75.5	90	100	115	130	155	195	225	260
L22	95	120	135	155	180	215	270	310	370
B1 ^{h9}	5	5	6	6	10	12	14	16	18
B2 ^{h9}	5	5	6	6	10	12	14	16	18
H1	15	18	20.5	24.5	35	43	53.5	59	64
H2	15	18	20.5	24.5	35	43	53.5	59	64



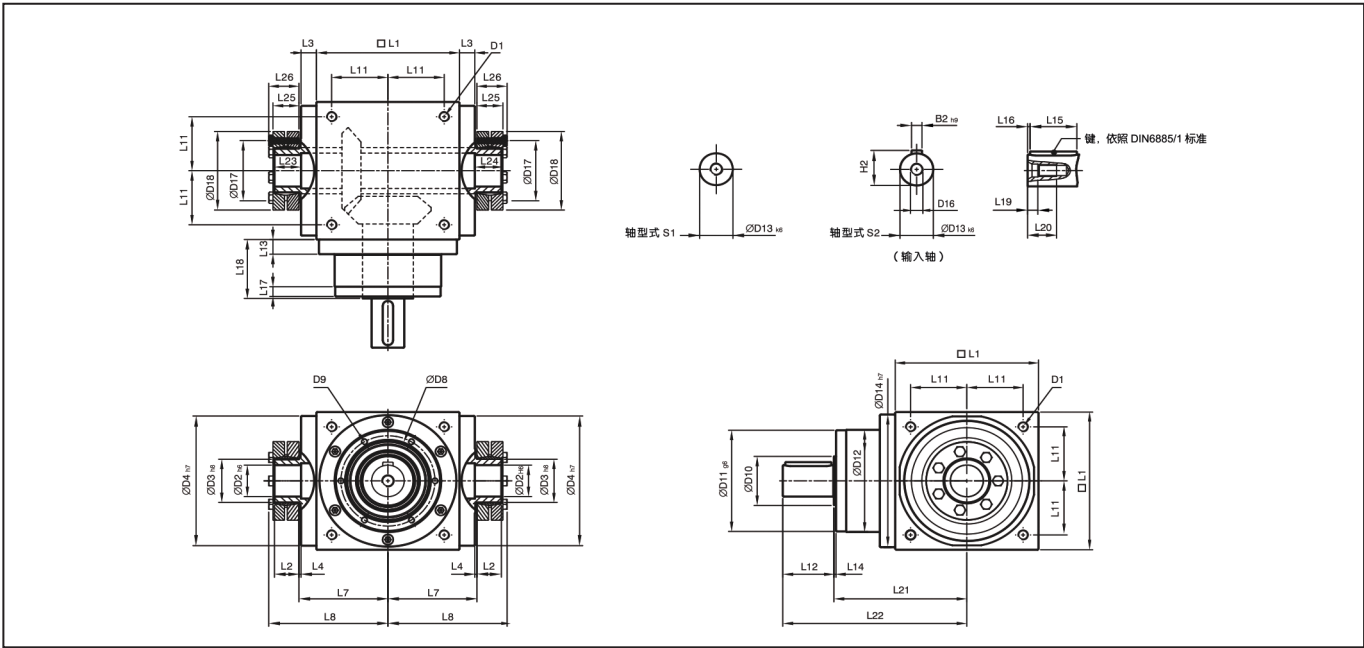
HT-H /HTB-H（单节，减速比 i=1~5）（single section, reduction ratio i = 1 ~ 5）



*HTB 系列的尺寸与 HT 系列相同。（单位：mm） The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065H	HT075H	HT090H	HT110H	HT140H	HT170H	HT210H	HT240H	HT280H
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D2 ^{h7}	13	14	18	22	32	40	50	55	60
D4 ^{h7}	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D7	21	22	28	33	47	55	75	85	110
D8	53	62	76	95	92	114	142	160	176
D9	4xM4xL7	4xM5xL8	4xM5xL8	6xM6xL10	6xM6xL10	6xM8xL12.5	6xM8xL12.5	6xM8xL12.5	6xM10xL15
D10	15.4	20.4	25.8	35.8	49.8	59.3	79.3	92.3	102.3
D11 ^{k6}	62.9	72.9	87	107	103	127	158	178	198
D12	62	72	86	106	104	128	160	180	200
D13 ^{k6}	13	16	18	22	32	40	50	55	60
D14 ^{h7}	63	73	88	108	135	165	205	235	275
D16	M4	M5	M5	M8	M12	M16	M16	M16	M20
L1	65	75	90	110	140	170	210	240	280
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127	147	167
L11	27	30	36	44	55	67	85	95	110
L12	19.5	30	35	40	50	60	75	85	110
L13	13	15	15	15	15	15	20	25	25
L14	2	2	2	2	2	2	2	2	2
L15	16	25	28	32	45	50	70	80	100
L16	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L17	6	8	8	8	10	10	10	10	10
L18	43	52.5	55	60	60	70	90	105	120
L19	4.5	4.8	4.8	7.2	10	12	12	12	15
L20	10	12.5	12.5	19	28	36	36	36	42
L21	75.5	90	100	115	130	155	195	225	260
L22	95	120	135	155	180	215	270	310	370
L23	40	47	52	53	70	80	95	115	115
L24	30	32	35	35	50	55	65	80	80
B2 ^{h9}	5	5	6	6	10	12	14	16	18
B3 ^{h8}	5	5	6	6	10	12	14	16	18
H2	15	18	20.5	24.5	35	43	53.5	59	64
H3	15.3	16.3	20.8	24.8	35.3	43.3	53.8	59.3	64.4

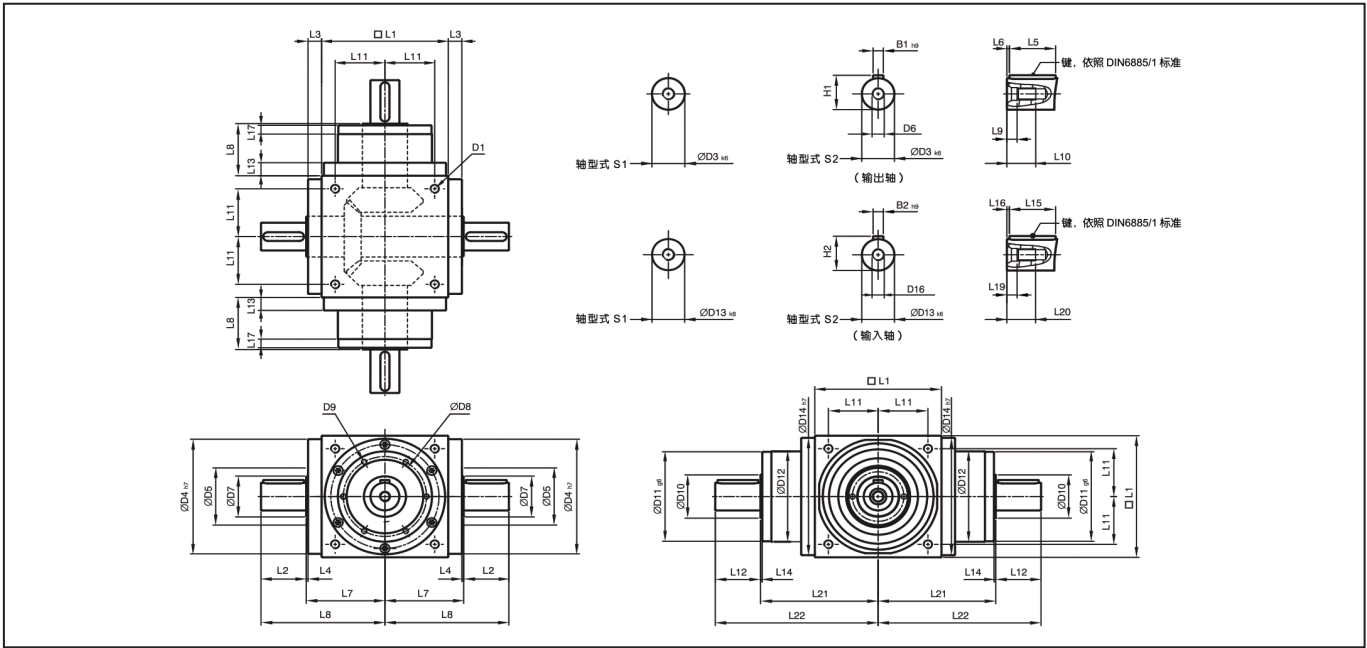
HT-C/HTB-C（单节，减速比 i=1~5）
 (single section, reduction ratio i = 1 ~ 5)



*HTB 系列的尺寸与 HT 系列相同。（单位：mm）
 *The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065C	HT075C	HT090C	HT110C	HT140C	HT170C	HT210C	HT240C	HT280C
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D2 ¹⁶	13	14	18	22	32	40	50	55	60
D3 ¹⁸	16	16	22	25	44	50	62	68	75
D4 ¹⁷	63	73	88	108	135	165	205	235	275
D8	53	62	76	95	92	114	142	160	176
D9	4xM4xL7	4xM5xL8	4xM5xL8	6xM6xL10	6xM6xL10	6xM8xL12.5	6xM8xL12.5	6xM8xL12.5	6xM10xL15
D10	15.4	20.4	25.8	35.8	49.8	59.3	79.3	92.3	102.3
D11 ⁶⁵	62.9	72.9	87	107	103	127	158	178	198
D12	62	72	86	106	104	128	160	180	200
D13 ⁶⁵	13	16	18	22	32	40	50	55	60
D14 ¹⁷	63	73	88	108	135	165	205	235	275
D16	M4	M5	M5	M8	M12	M16	M16	M16	M20
D17	26	26	36	38	61	70	86	86	100
D18	41	41	50	50	80	90	110	115	138
L1	65	75	90	110	140	170	210	240	280
L2	14	14	18	18	24	26	29	29	30.5
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127	147	167
L8	66	72.5	85	95	116.5	133.5	161.5	181.5	205
L11	27	30	36	44	55	67	85	95	110
L12	19.5	30	35	40	50	60	75	85	110
L13	13	15	15	15	15	15	20	25	25
L14	2	2	2	2	2	2	2	2	2
L15	16	25	28	32	45	50	70	80	100
L16	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L17	6	8	8	8	10	10	10	10	10
L18	43	52.5	55	60	60	70	90	105	120
L19	4.5	4.8	4.8	7.2	10	12	12	12	15
L20	10	12.5	12.5	19	28	36	36	36	42
L21	75.5	90	100	115	130	155	195	225	260
L22	95	120	135	155	180	215	270	310	370
L23	15	15	20	20	26	28	31	31	32.5
L24	15	15	20	20	26	28	31	31	32.5
L25	15	15	19.5	19.5	25.5	27.5	30.5	30.5	32.5
L26	18.5	18.5	23	23	29.5	31.5	34.5	34.5	38
B2 ¹⁰	5	5	6	6	10	12	14	16	18
H2	15	18	20.5	24.5	35	43	53.5	59	64

HT-4M/HTB-4M（单节，减速比 i=1）
 (single section, reduction ratio i = 1)



*HTB 系列的尺寸与 HT 系列相同。（单位：mm）
 *The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065 4M	HT075 4M	HT090 4M	HT110 4M	HT140 4M	HT170 4M	HT210 4M	HT240 4M	HT280 4M
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D3 ¹⁶	13	16	18	22	32	40	50	55	60
D4 ¹⁷	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D6	M4	M5	M5	M8	M12	M16	M16	M16	M20
D7	21	22	28	33	47	55	75	85	110
D8	53	62	76	95	92	114	142	160	176
D9	4xM4xL7	4xM5xL8	4xM5xL8	6xM6xL10	6xM6xL10	6xM8xL12.5	6xM8xL12.5	6xM8xL12.5	6xM10xL15
D10	15.4	20.4	25.8	35.8	49.8	59.3	79.3	92.3	102.3
D11 ⁶⁵	62.9	72.9	87	107	103	127	158	178	198
D12	62	72	86	106	104	128	160	180	200
D13 ⁶⁵	13	16	18	22	32	40	50	55	60
D14 ¹⁷	63	73	88	108	135	165	205	235	275
D16	M4	M5	M5	M8	M12	M16	M16	M16	M20
L1	65	75	90	110	140	170	210	240	280
L2	19.5	30	35	40	50	60	75	85	110
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70	80	100
L6	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L7	47.5	54	62	72	87	102	127	147	167
L8	67	84	97	112	137	162	202	232	277
L9	4.5	4.8	4.8	7.2	10	12	12	12	15
L10	10	12.5	12.5	19	28	36	36	36	42
L11	27	30	36	44	55	67	85	95	110
L12	19.5	30	35	40	50	60	75	85	110
L13	13	15	15	15	15	15	20	25	25
L14	2	2	2	2	2	2	2	2	2
L15	16	25	28	32	45	50	70	80	100
L16	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L17	6	8	8	8	10	10	10	10	10
L18	43	52.5	55	60	60	70	90	105	120
L19	4.5	4.8	4.8	7.2	10	12	12	12	15
L20	10	12.5	12.5	19	28	36	36	36	42
L21	75.5	90	100	115	130	155	195	225	260
L22	95	120	135	155	180	215	270	310	370
B1 ¹⁰	5	5	6	6	10	12	14	16	18
B2 ¹⁰	5	5	6	6	10	12	14	16	18
H1	15	18	20.5	24.5	35	43	53.5	59	64
H2	15	18	20.5	24.5	35	43	53.5	59	64

HT/HTB 法兰型

性能参数表（HTB 系列的性能， 规范与 HT 系列相同）

Table of performance parameters (performance specification of HTB series is the same as that of HT series)

规格 Model	单位 Unit	节数 Stage	减速比 Ratio	HT065 FL HT065 FL1 HT065 FH HT065 FC HT065 FR1	HT075 FL HT075 FL1 HT075 FH HT075 FC HT075 FR1	HT090 FL HT090 FL1 HT090 FH HT090 FC HT090 FR1	HT110 F L HT110 FL1 HT110 FH HT110 FC HT110 FR1	HT140 FL HT140 FL1 HT140 FH HT140 FC HT140 FR1	HT170 FL HT170 FL1 HT170 FH HT170 FC HT170 FR1	HT210 FL HT210 FL1 HT210 FH HT210 FC HT210 FR1	HT240 FL HT240 FL1 HT240 FH HT240 FC HT240 FR1	HT280 FL HT280 FL1 HT280 FH HT280 FC HT280 FR1
额定输出力矩 Rated output torque T _{2N}	Nm	1	1	25	45	78	150	360	585	1,300	2,150	3,200
			1.5	25	45	78	150	360	585	1,300	2,150	3,200
			2	24	42	68	150	330	544	1,220	2,010	3,050
			3	18	33	54	120	270	450	1,020	1,650	2,850
			4	13	28	48	100	224	376	860	1,410	2,300
			5	12	25	40	85	196	320	740	1,210	2,000
		2	7	25	30	70	165	196	220	450	960	1050
			10	24	28	68	150	208	208	430	846	846
			15	18	33	54	120	270	312	645	1,269	1,269
			20	13	28	48	100	224	376	860	1,410	1,692
			25	12	25	40	85	196	320	740	1,210	2,000
			35	12	25	40	85	196	320	740	1,210	1,790
		3	50	12	25	40	85	196	320	740	1,210	1,465
			75	-	45	78	120	210	312	585	1,269	1,269
			100	-	45	78	100	224	376	780	1,410	1,692
			125	-	45	78	85	196	320	740	1,210	2,000
			150	-	45	78	120	135	312	390	975	975
			200	-	45	78	100	180	376	520	1,300	1,300
			250	-	45	78	85	196	320	650	1,210	1,625
			350	-	45	78	85	196	320	740	1,210	1,790
			500	-	45	78	85	196	320	740	1,210	1,465
最大加速力矩 T _{2B}	Nm	1,2,3	1~500	1.5 倍额定输出力矩								
最大加速输入转速 n _{1B}	rpm	1	1~5	7,500	6,500	5,500	4,500	3,500	3,000	2,200	2,000	1,700
		2	7~50	8,000	8,000	6,000	6,000	6,000	6,000	4,800	3,600	3,600
		3	75~500	-	-	-	8,000	8,000	6,000	6,000	6,000	6,000
齿隙 ^B	arcmin	1	1~5	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6	≤ 6
		2	7~50	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 13	≤ 13	≤ 13	≤ 13
		3	75~500	-	-	-	≤ 15	≤ 15	≤ 18	≤ 18	≤ 25	≤ 25
容许径向力 F _{2rB} ^C 输出轴 d2	N	1,2,3	1~500	900	1,100	1,700	2,700	4,800	6,600	11,500	16,000	18,000
容许轴向力 F _{2aB} ^C 输出轴 d2	N	1,2,3	1~500	450	550	850	1350	2,400	3,300	5,750	8,500	9,000
使用寿命 ^D	hr	1,2,3	1~500	20,000								
效率 η	%	1	1~5	≥ 94%								
		2,3	7~500	≥ 90%								
使用温度	°C	1,2,3	1~500	-10°C ~ 90°C								
润滑				合成润滑脂								
噪音值 (n=1500rpm, 无负载) ^E	dB (A)	1,2,3	1~500	≤ 71	≤ 72	≤ 76	≤ 77	≤ 78	≤ 79	≤ 81	≤ 83	≤ 84

HT/HTB 法兰型

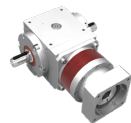
减速机转动惯量（HTB 系列的性能，规范与 HT 系列相同）

Moment of inertia of reducer (the performance of HTB series is the same as that of HT series)

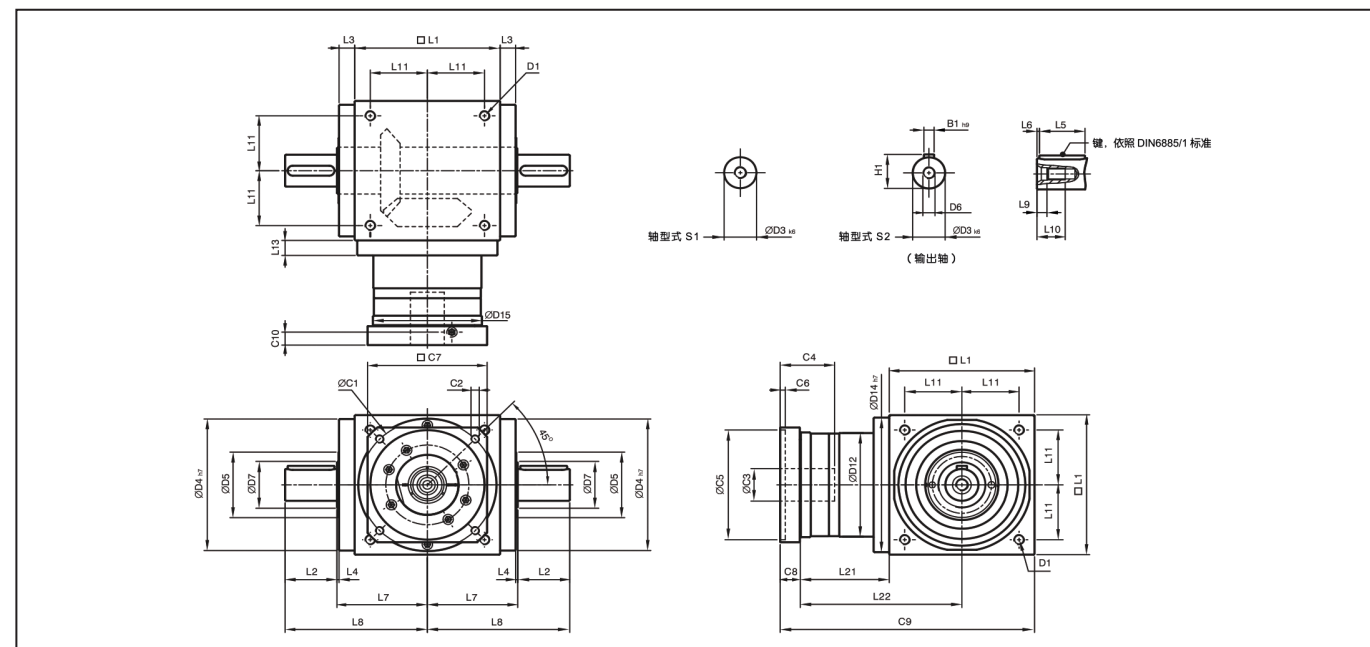
规格 Model	单位 Unit	节数 Stage	减速比 Ratio	HT065 FL HT065 FL1 HT065 FH HT065 FC HT065 FR1	HT075 FL HT075 FL1 HT075 FH HT075 FC HT075 FR1	HT090 FL HT090 FL1 HT090 FH HT090 FC HT090 FR1	HT110 F L HT110 FL1 HT110 FH HT110 FC HT110 FR1	HT140 FL HT140 FL1 HT140 FH HT140 FC HT140 FR1	HT170 FL HT170 FL1 HT170 FH HT170 FC HT170 FR1	HT210 FL HT210 FL1 HT210 FH HT210 FC HT210 FR1	HT240 FL HT240 FL1 HT240 FH HT240 FC HT240 FR1	HT280 FL HT280 FL1 HT280 FH HT280 FC HT280 FR1
转动惯量 J ₁	kg.cm ²	1	1	0.51	1.30	3.14	7.62	23.54	59.09	195.96	365.38	787.63
			1.5	0.46	1.15	2.80	6.65	19.34	49.38	156.02	279.62	584.28
			2	0.44	1.10	2.68	6.23	17.72	45.44	140.80	245.78	500.26
			3	0.43	1.09	2.64	6.08	17.16	44.11	135.51	233.75	471.56
			4	0.43	1.08	2.63	6.05	17.03	43.79	134.14	230.77	464.76
			5	0.43	1.08	2.63	6.04	16.99	43.69	133.71	229.71	462.08
		2	7	0.15	0.15	0.50	2.79	2.79	2.79	9.91	29.26	29.26
			10	0.15	0.15	0.50	2.80	2.80	2.80	9.96	29.43	29.43
			15	0.15	0.15	0.50	2.80	2.80	2.80	9.96	29.43	29.43
			20	0.15	0.15	0.50	2.80	2.80	2.80	9.96	29.43	29.43
			25	0.15	0.15	0.50	2.80	2.80	2.80	9.96	29.43	29.43
			35	0.15	0.15	0.50	2.79	2.79	2.79.	9.91	29.26	29.26
			50	0.15	0.15	0.50	2.79	2.79	2.79	9.89	29.20	29.20
		3	75	-	-	-	0.15	0.15	0.50	0.50	2.80	2.80
			100	-	-	-	0.15	0.15	0.50	0.50	2.80	2.80
			125	-	-	-	0.15	0.15	0.50	0.50	2.80	2.80
			150	-	-	-	0.15	0.15	0.50	0.50	2.79	2.79
			200	-	-	-	0.15	0.15	0.50	0.50	2.79	2.79
			250	-	-	-	0.15	0.15	0.50	0.50	2.79	2.79
			350	-	-	-	0.15	0.15	0.50	0.50	2.79	2.79
			500	-	-	-	0.15	0.15	0.50	0.50	2.79	2.79

重量 WEIGHT

减速机型号	单位 Unit	节数 Stage	减速比 Ratio	HT065	HT075	HT090	HT110	HT140	HT170	HT210	HT240	HT280
FL 系列	kg	1	1~5	2.8	4.4	7.1	12.1	20.9	36.1	69.4	101.2	158.3
		2	7~50	3.2	4.8	8.1	14.3	24.2	38.5	74.1	112.4	171.0
		3	75~500	-	-	-	13.9	23.7	38.8	73.4	110.2	168.7
FL1 系列		1	1~5	2.7	4.3	7.1	11.9	20.3	35.5	68.3	99.6	156.0
		2	7~50	3.2	4.8	8.0	14.2	23.9	37.9	73.0	110.8	168.6
		3	75~500	-	-	-	13.8	23.4	38.2	72.3	108.6	166.4
FH 系列		1	1~5	2.6	4.1	6.7	11.4	18.9	32.9	63.2	92.5	146.0
		2	7~50	3.1	4.6	7.7	13.6	22.4	35.3	67.9	103.7	158.7
		3	75~500	-	-	-	13.3	21.9	35.6	67.2	101.5	156.5
FC 系列		1	1~5	2.9	4.4	7.2	11.8	20.4	35.0	66.5	96.0	151.7
		2	7~50	3.3	4.9	8.2	14.1	24.1	37.4	71.2	107.2	164.4
		3	75~500	-	-	-	13.7	23.5	37.5	70.5	105.0	162.2
FR1 系列		1	1~5	2.7	4.3	7.1	11.9	20.3	35.5	68.3	99.6	156.0
		2	7~50	3.2	4.8	8.0	14.2	23.9	37.9	73.0	110.8	168.6
		3	75~500	-	-	-	13.8	23.4	38.2	72.3	108.6	166.4



HT-FL/ HTB-FL (单节, 减速比 $i=1\sim5$) (single section, reduction ratio $i = 1 \sim 5$)

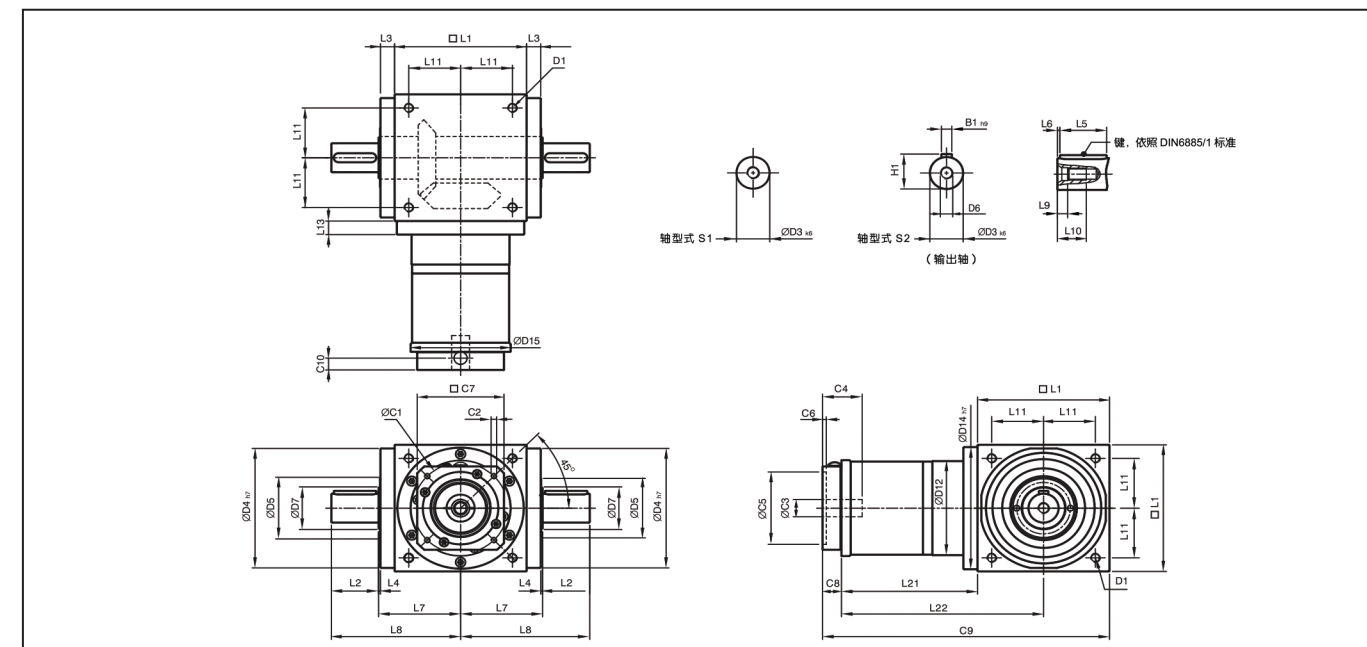


*HTB 系列的尺寸与 HT 系列相同。(单位: mm) The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065 FL	HT075 FL	HT090 FL	HT110 FL	HT140 FL	HT170 FL	HT210 FL	HT240 FL	HT280 FL
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D3 ⁶	13	16	18	22	32	40	50	55	60
D4 ⁷	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D6	M4	M5	M5	M8	M12	M16	M16	M16	M20
D7	21	22	28	33	47	55	75	85	110
D12	62	72	86	106	104	128	160	180	200
D14 ⁷	63	73	88	108	135	165	205	235	275
D15	62.9	72.9	87	107	105	130	158	178	198
L1	65	75	90	110	140	170	210	240	280
L2	19.5	30	35	40	50	60	75	85	110
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70	80	100
L6	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L7	47.5	54	62	72	87	102	127	147	167
L8	67	84	97	112	137	162	202	232	277
L9	4.5	4.8	4.8	7.2	10	12	12	12	15
L10	10	12.5	12.5	19	28	36	36	36	42
L11	27	30	36	44	55	67	85	95	110
L13	13	15	15	15	15	15	20	25	25
L21	49	60.5	63	69.5	85.5	95	130	144.5	135
L22	81.5	98	108	124.5	155.5	180	235	264.5	275
C1 ¹	46	70	100	100	130	165	215	215	235
C2 ¹	M4	M5	M6	M6	M8	M10	M12	M12	M12
C3 ¹	≤ 8/ ≤ 14 ²	≤ 14/ ≤ 15.875/ ≤ 19 ²	≤ 19	≤ 24	≤ 35	≤ 38	≤ 42	≤ 48	≤ 55
C4 ¹	30	34	40	40	50	60	85	85	116
C5 ¹	30	50	80	80	110	130	180	180	200
C6 ¹	3.5	8	4	4	5	6	6	6	6
C7 ¹	42	60	90	90	115	142	190	190	220
C8 ¹	19.5	19	17	17	19.5	22.5	29	29	63
C9 ¹	133.5	154.5	170	196.5	245	287.5	369	413.5	478
C10 ¹	13.25	13.5	10.75	10.75	13	15	20.75	20.75	53.5
B1 ^{h9}	5	5	6	6	10	12	14	16	18
H1	15	18	20.5	24.5	35	43	53.5	59	64



HT-FL/HTB-FL (双节, 减速比 $i=7\sim50$) (double section, reduction ratio $i = 7 \sim 50$)

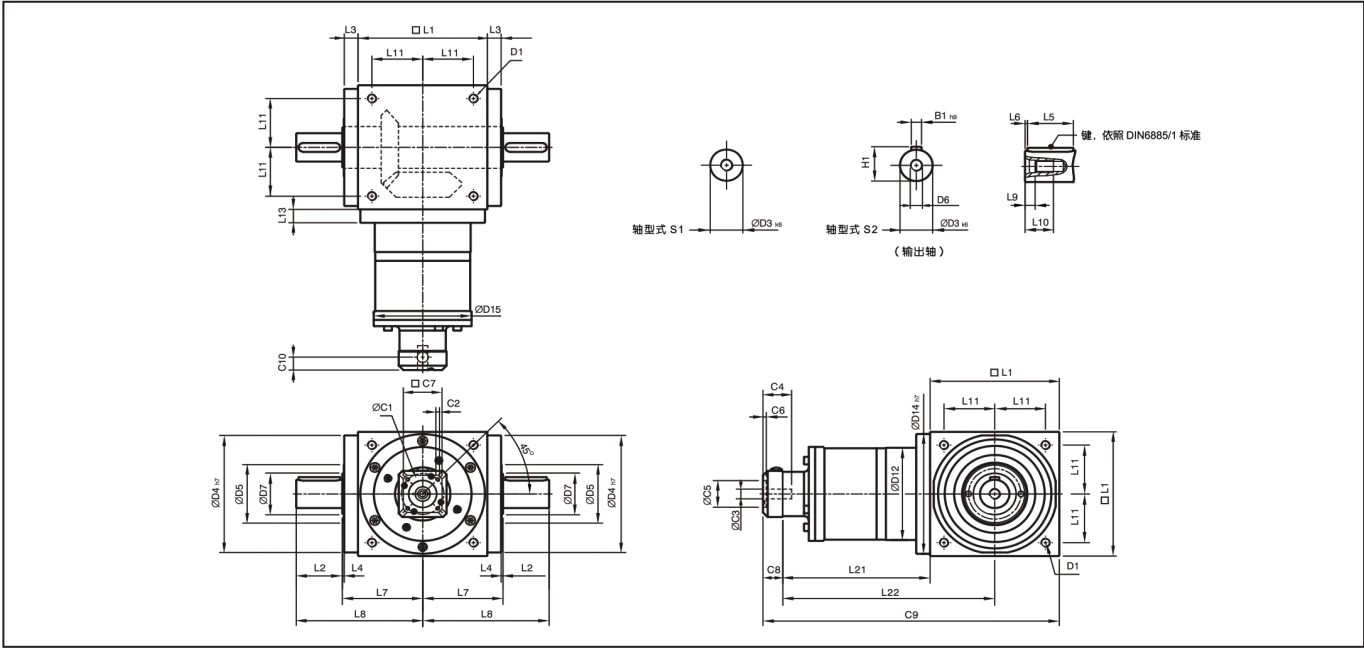


*HTB 系列的尺寸与 HT 系列相同。(单位 : mm) The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065 FL	HT075 FL	HT090 FL	HT110 FL	HT140 FL	HT170 FL	HT210 FL	HT240 FL	HT280 FL
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D3 ^{K6}	13	16	18	22	32	40	50	55	60
D4 ^{h7}	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D6	M4	M5	M5	M8	M12	M16	M16	M16	M20
D7	21	22	28	33	47	55	75	85	110
D12	62	72	86	106	104	128	160	180	200
D14 ^{h7}	63	73	88	108	135	165	205	235	275
D15	62.9	72.9	87	107	106	130	158	178	198
L1	65	75	90	110	140	170	210	240	280
L2	19.5	30	35	40	50	60	75	85	110
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L5	16	25	28	32	45	50	70	80	100
L6	2	2.5	3.5	4	2.5	5	2.5	2.5	5
L7	47.5	54	62	72	87	102	127	147	167
L8	67	84	97	112	137	162	202	232	277
L9	4.5	4.8	4.8	7.2	10	12	12	12	15
L10	10	12.5	12.5	19	28	36	36	36	42
L11	27	30	36	44	55	67	85	95	110
L13	13	15	15	15	15	15	20	25	25
L21	75	84.5	99	122	144.5	157.5	206.5	239	248
L22	107.5	122	144	177	214.5	242.5	311.5	359	388
C1 ⁹	46	70	100	100	130	165	215	215	235
C2 ⁹	M4	M5	M6	M6	M8	M10	M12	M12	M12
C3 ⁹	≤ 11/ ≤ 12 ¹⁰	≤ 14/ ≤ 15.875/16 ¹⁰	≤ 19	≤ 24	≤ 32	≤ 38	≤ 42	≤ 48	≤ 55
C4 ⁹	30	34	40	40	50	60	85	85	116
C5 ⁹	30	50	80	80	110	130	180	180	200
C6 ⁹	3.5	8	4	4	5	6	6	6	6
C7 ⁹	42	60	90	90	115	142	190	190	220
C8 ⁹	19.5	19	17	17	19.5	22.5	29	29	63
C9 ⁹	133.5	154.5	170	196.5	245	287.5	369	413.5	478
C10 ⁹	13.25	13.5	10.75	10.75	13	15	20.75	20.75	53.5
B3 ^{P9}	5	5	6	6	10	12	14	16	18
H3	15.3	16.3	20.8	24.8	35.3	43.3	53.8	59.3	64.4

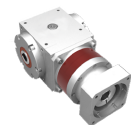


HT-FL/HTB-FL（三节，减速比 i=75~500）（Section III, reduction ratio i = 75 ~ 500）

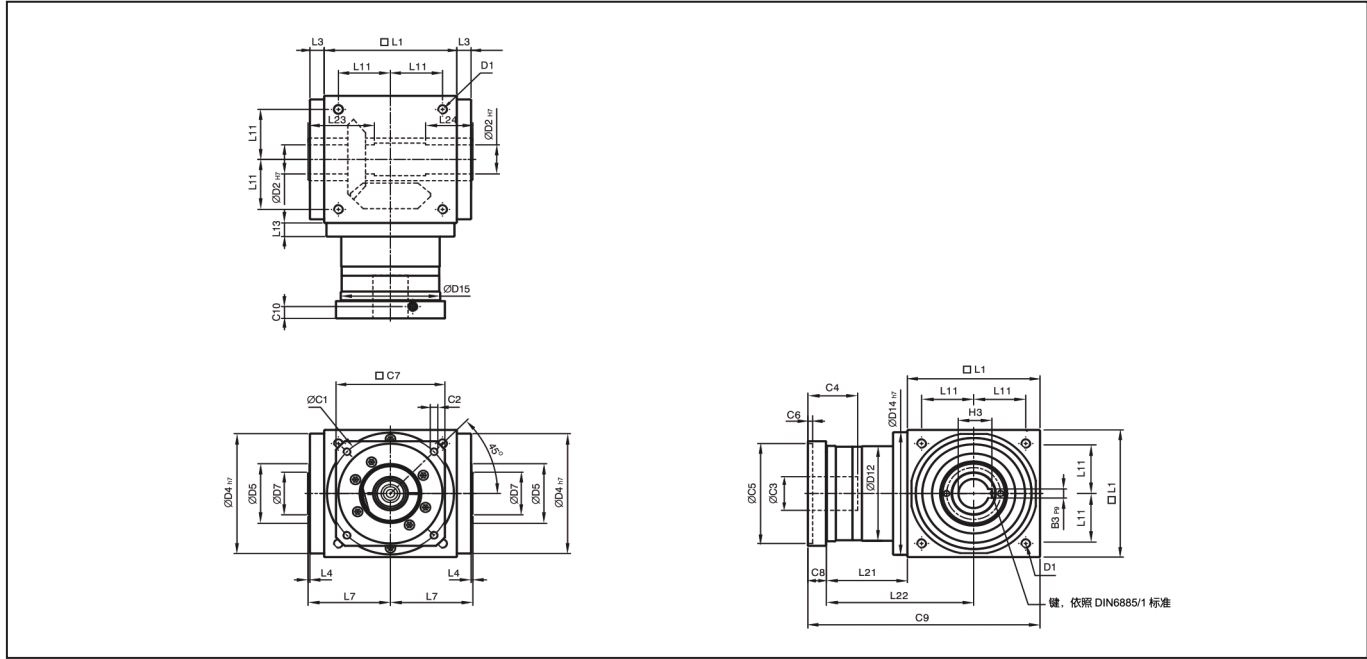


*HTB 系列的尺寸与 HT 系列相同。（单位：mm） The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT110 FL	HT140 FL	HT170 FL	HT210 FL	HT240 FL	HT280 FL
D1	M8	M10	M12	M16	M16	M16
D3 ^{R6}	22	32	40	50	55	60
D4 ^{H7}	108	135	165	205	235	275
D5	53	68	83	104	124	144
D6	M8	M12	M16	M16	M16	M20
D7	33	47	55	75	85	110
D12	106	104	128	160	180	200
D14 ^{H7}	108	135	165	205	235	275
D15	107	106	130	158	178	198
L1	110	140	170	210	240	280
L2	40	50	60	75	85	110
L3	15	15	15	20	25	25
L4	2	2	2	2	2	2
L5	32	45	50	70	80	100
L6	4	2.5	5	2.5	2.5	5
L7	72	87	102	127	147	167
L8	112	137	162	202	232	277
L9	7.2	10	12	12	12	15
L10	19	28	36	36	36	42
L11	44	55	67	85	95	110
L13	15	15	15	20	25	25
L21	136.5	159.5	183.5	226	269	278
L22	191.5	229.5	268.5	331	389	418
C1 ⁴	46	46	70	70	100	100
C2 ⁴	M4	M4	M5	M5	M6	M6
C3 ⁴	≤ 12	≤ 12	≤ 16	≤ 16	≤ 24	≤ 24
C4 ⁴	30	30	34	34	40	40
C5 ⁴	30	30	50	50	80	80
C6 ⁴	3.5	3.5	8	8	4	4
C7 ⁴	42	42	60	60	92	92
C8 ⁴	21.5	21.5	21.5	21.5	20	20
C9 ⁴	268	321	375	457.5	529	578
C10 ⁴	14.5	14.5	15.5	15.5	13	13
B1 ^{H9}	6	10	12	14	16	18
H1	24.5	35	43	53.5	59	64

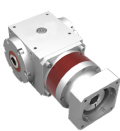


HT-FH/HTB-FH（单节，减速比 i=1~5）（single section, reduction ratio i = 1 ~ 5）

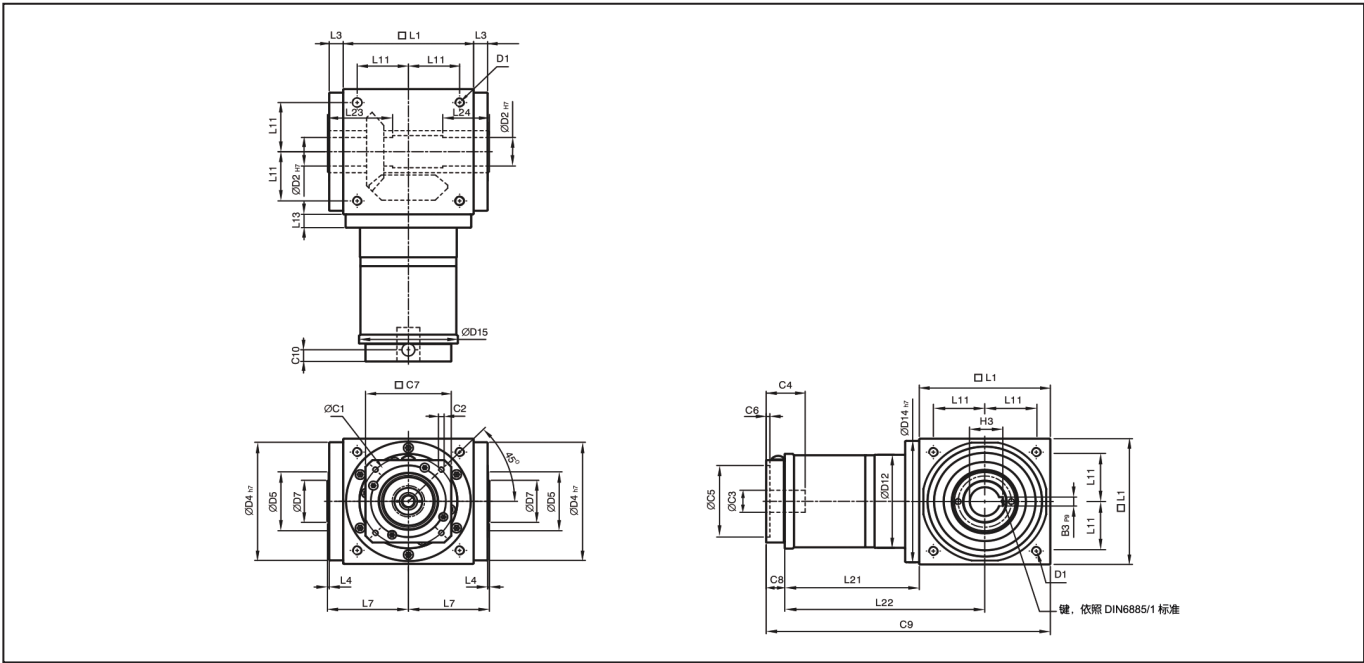


*HTB 系列的尺寸与 HT 系列相同。（单位：mm） The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065FH	HT075FH	HT090FH	HT110FH	HT140FH	HT170FH	HT210FH	HT240FH	HT280FH
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D2 ^{H7}	13	14	18	22	32	40	50	55	60
D4 ^{H7}	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D7	21	22	28	33	47	55	75	85	110
D12	62	72	86	106	104	128	160	180	200
D14 ^{H7}	63	73	88	108	135	165	205	235	275
D15	62.9	72.9	87	107	105	130	158	178	198
L1	65	75	90	110	140	170	210	240	280
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127	147	167
L11	27	30	36	44	55	67	85	95	110
L13	13	15	15	15	15	15	20	25	25
L21	49	60.5	63	69.5	85.5	95	130	144.5	135
L22	81.5	98	108	124.5	155.5	180	235	264.5	275
L23	40	47	52	53	70	80	95	115	115
L24	30	32	35	35	50	55	65	80	80
C1 ³	46	70	100	100	130	165	215	215	235
C2 ³	M4	M5	M6	M6	M8	M10	M12	M12	M12
C3 ³	≤ 11/ ≤ 12 ¹⁰	≤ 14/ ≤ 15.875/16 ¹⁰	≤ 19	≤ 24	≤ 32	≤ 38	≤ 42	≤ 48	≤ 55
C4 ³	30	34	40	40	50	60	85	85	116
C5 ³	30	50	80	80	110	130	180	180	200
C6 ³	3.5	8	4	4	5	6	6	6	6
C7 ³	42	60	90	90	115	142	190	190	220
C8 ³	19.5	19	17	17	19.5	22.5	29	29	63
C9 ³	133.5	154.5	170	196.5	245	287.5	369	413.5	478
C10 ³	13.25	13.5	10.75	10.75	13	15	20.75	20.75	53.5
B3 ^{H9}	5	5	6	6	10	12	14	16	18
H3	15.3	16.3	20.8	24.8	35.3	43.3	53.8	59.3	64.4



HT-FH/HTB-FH (双节，减速比 i=7~50) (double section, reduction ratio i = 7 ~ 50)

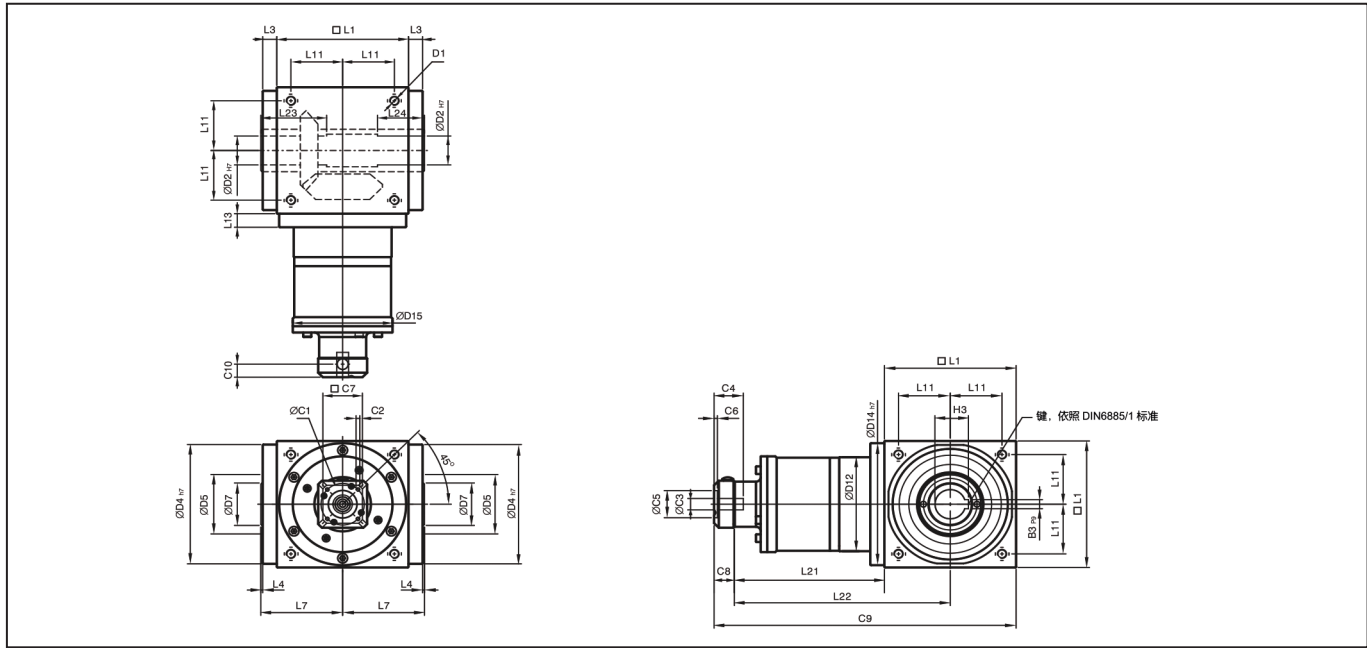


*HTB 系列的尺寸与 HT 系列相同。（单位：mm） The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065FH	HT075FH	HT090FH	HT110FH	HT140FH	HT170FH	HT210FH	HT240FH	HT280FH
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D2 ^{H7}	13	14	18	22	32	40	50	55	60
D4 ^{H7}	63	73	88	108	135	165	205	235	275
D5	31	35	43	53	68	83	104	124	144
D7	21	22	28	33	47	55	75	85	110
D12	62	72	86	106	104	128	160	180	200
D14 ^{H7}	63	73	88	108	135	165	205	235	275
D15	62.9	72.9	87	107	106	130	158	178	198
L1	65	75	90	110	140	170	210	240	280
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127	147	167
L11	27	30	36	44	55	67	85	95	110
L13	13	15	15	15	15	15	20	25	25
L21	75	84.5	99	122	144.5	157.5	206.5	239	248
L22	107.5	122	144	177	214.5	242.5	311.5	359	388
L23	40	47	52	53	70	80	95	115	115
L24	30	32	35	35	50	55	65	80	80
C1 ^{H1}	46	46	70	100	100	100	130	165	165
C2 ^{H1}	M4	M4	M5	M6	M6	M6	M8	M10	M10
C3 ^{H1}	≤ 12	≤ 12	≤ 16	≤ 24	≤ 24	≤ 24	≤ 32	≤ 38	≤ 38
C4 ^{H1}	30	30	34	40	40	40	50	60	60
C5 ^{H1}	30	30	50	80	80	80	110	130	130
C6 ^{H1}	3.5	3.5	8	4	4	4	5	6	6
C7 ^{H1}	42	42	60	92	92	92	115	142	142
C8 ^{H1}	21.5	21.5	21.5	20	20	20	24	31	31
C9 ^{H1}	161.5	181	210.5	252	304.5	347.5	440.5	510	559
C10 ^{H1}	14.5	14.5	15.5	13	13	13	16	21	21
B3 ^{P9}	5	5	6	6	10	12	14	16	18
H3	15.3	16.3	20.8	24.8	35.3	43.3	53.8	59.3	64.4



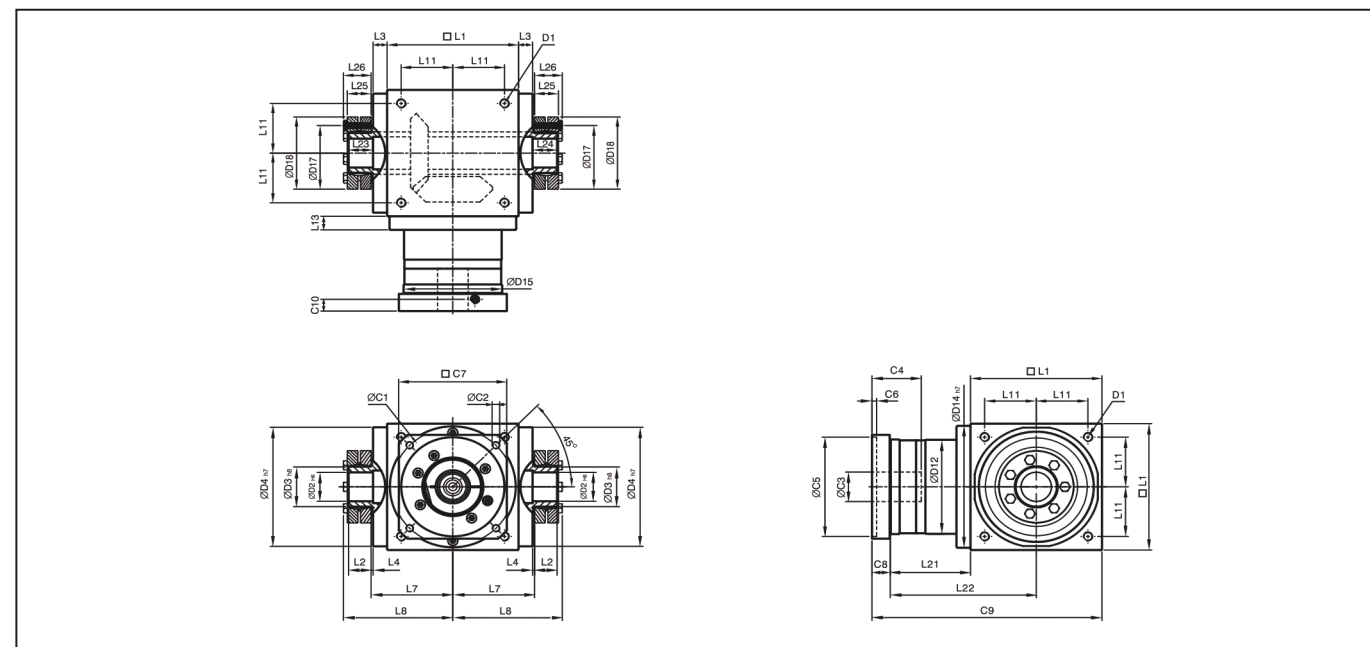
HT-FH/HTB-FH (三节，减速比 i=75~500) (Section III, reduction ratio i = 75 ~ 500)



*HTB 系列的尺寸与 HT 系列相同。（单位：mm） The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT110FH	HT140FH	HT170FH	HT210FH	HT240FH	HT280FH
D1	M8	M10	M12	M16	M16	M16
D2 ^{H7}	22	32	40	50	55	60
D4 ^{H7}	108	135	165	205	235	275
D5	53	68	83	104	124	144
D7	33	47	55	75	85	110
D12	106	104	128	160	180	200
D14 ^{H7}	108	135	165	205	235	275
D15	107	106	130	158	178	198
L1	110	140	170	210	240	280
L3	15	15	15	20	25	25
L4	2	2	2	2	2	2
L7	72	87	102	127	147	167
L11	44	55	67	85	95	110
L13	15	15	15	20	25	25
L21	136.5	159.5	183.5	226	269	278
L22	191.5	229.5	268.5	331	389	418
L23	53	70	80	95	115	115
L24	35	50	55	65	80	80
C1 ¹²	46	46	70	70	100	100
C2 ¹²	M4	M4	M5	M5	M6	M6
C3 ¹²	≤ 12	≤ 12	≤ 16	≤ 16	≤ 24	≤ 24
C4 ¹²	30	30	34	34	40	40
C5 ¹²	30	30	50	50	80	80
C6 ¹²	3.5	3.5	8	8	4	4
C7 ¹²	42	42	60	60	92	92
C8 ¹²	21.5	21.5	21.5	21.5	20	20
C9 ¹²	268	321	375	457.5	529	578
C10 ¹²	14.5	14.5	15.5	15.5	13	13
B3 ^{P9}	6	10	12	14	16	18
H3	24.8	35.3	43.3	53.8	59.3	64.4

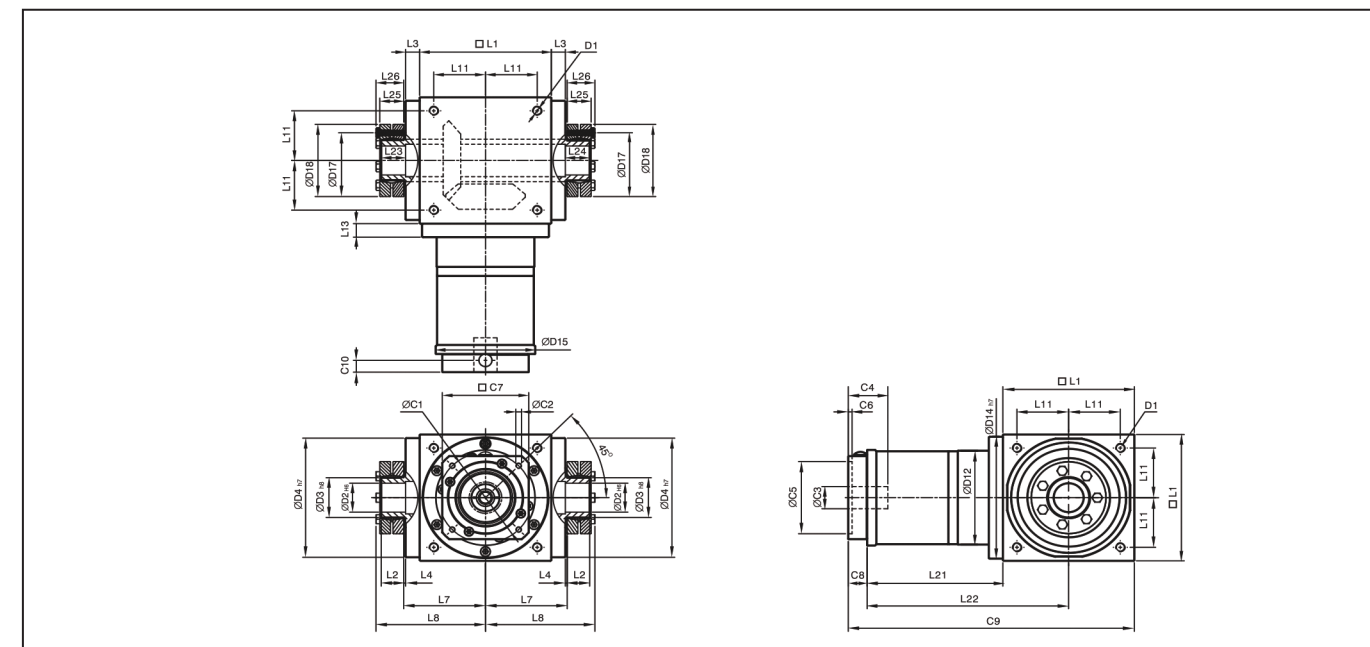
HT-FC/HTB-FC (单节, 减速比 $i=1\sim5$) (single section, reduction ratio $i=1\sim5$)



*HTB 系列的尺寸与 HT 系列相同。(单位: mm) The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065FC	HT075FC	HT090FC	HT110FC	HT140FC	HT170FC	HT210FC	HT240FC	HT280FC
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D2 ^{H6}	13	14	18	22	32	40	50	55	60
D3 ^{H8}	16	16	22	25	44	50	62	68	75
D4 ^{H7}	63	73	88	108	135	165	205	235	275
D12	62	72	86	106	104	128	160	180	200
D14 ^{H7}	63	73	88	108	135	165	205	235	275
D15	62.9	72.9	87	107	105	130	158	178	198
D17	26	26	36	38	61	70	86	86	100
D18	41	41	50	50	80	90	110	115	138
L1	65	75	90	110	140	170	210	240	280
L2	14	14	18	18	24	26	29	29	30.5
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127	147	167
L8	66	72.5	85	95	116.5	133.5	161.5	181.5	205
L11	27	30	36	44	55	67	85	95	110
L13	13	15	15	15	15	15	20	25	25
L21	49	60.5	63	69.5	85.5	95	130	144.5	135
L22	81.5	98	108	124.5	155.5	180	235	264.5	275
L23	15	15	20	20	26	28	31	31	32.5
L24	15	15	20	20	26	28	31	31	32.5
L25	15	15	19.5	19.5	25.5	27.5	30.5	30.5	32.5
L26	18.5	18.5	23	23	29.5	31.5	34.5	34.5	38
C1 ¹³	46	70	100	100	130	165	215	215	235
C2 ¹³	M4	M5	M6	M6	M8	M10	M12	M12	M12
C3 ¹³	≤ 11/ ≤ 12 ¹⁴	≤ 14/ ≤ 15.875/16 ¹⁴	≤ 19	≤ 24	≤ 32	≤ 38	≤ 42	≤ 48	≤ 55
C4 ¹³	30	34	40	40	50	60	85	85	116
C5 ¹³	30	50	80	80	110	130	180	180	200
C6 ¹³	3.5	8	4	4	5	6	6	6	6
C7 ¹³	42	60	90	90	115	142	190	190	220
C8 ¹³	19.5	19	17	17	19.5	22.5	29	29	63
C9 ¹³	133.5	154.5	170	196.5	245	287.5	369	413.5	478
C10 ¹³	13.25	13.5	10.75	10.75	13	15	20.75	20.75	53.5

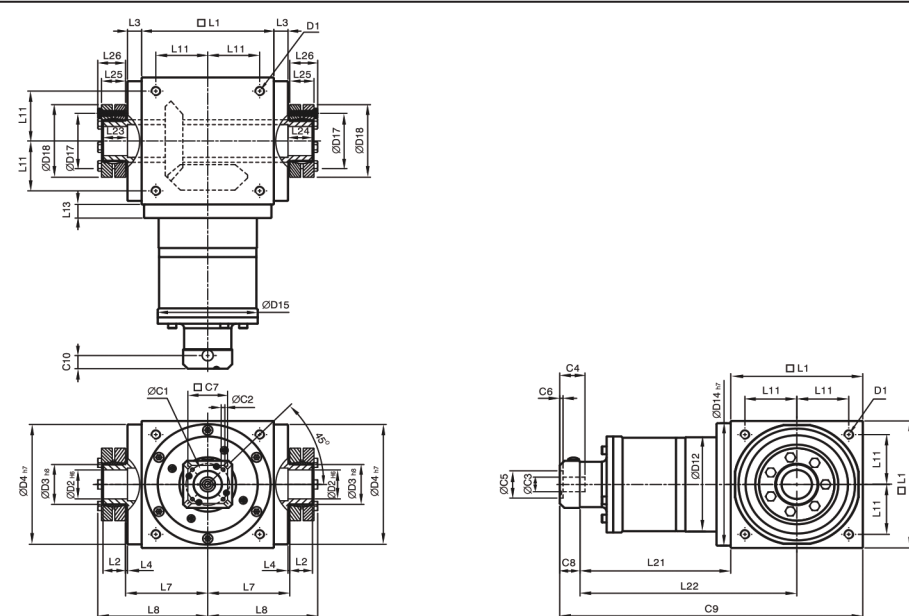
HT-FC/HTB-FC (三节, 减速比 $i=7\sim50$) (Section III, reduction ratio $i=7\sim50$)



*HTB 系列的尺寸与 HT 系列相同。(单位: mm) *The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT065FC	HT075FC	HT090FC	HT110FC	HT140FC	HT170FC	HT210FC	HT240FC	HT280FC
D1	M4	M6	M6	M8	M10	M12	M16	M16	M16
D2 ^{H6}	13	14	18	22	32	40	50	55	60
D3 ^{H8}	16	16	22	25	44	50	62	68	75
D4 ^{H7}	63	73	88	108	135	165	205	235	275
D12	62	72	86	106	104	128	160	180	200
D14 ^{H7}	63	73	88	108	135	165	205	235	275
D15	62.9	72.9	87	107	106	130	158	178	198
D17	26	26	36	38	61	70	86	86	100
D18	41	41	50	50	80	90	110	115	138
L1	65	75	90	110	140	170	210	240	280
L2	14	14	18	18	24	26	29	29	30.5
L3	13	14.5	15	15	15	15	20	25	25
L4	2	2	2	2	2	2	2	2	2
L7	47.5	54	62	72	87	102	127	147	167
L8	66	72.5	85	95	116.5	133.5	161.5	181.5	205
L11	27	30	36	44	55	67	85	95	110
L13	13	15	15	15	15	15	20	25	25
L21	75	84.5	99	122	144.5	157.5	206.5	239	248
L22	107.5	122	144	177	214.5	242.5	311.5	359	388
L23	15	15	20	20	26	28	31	31	32.5
L24	15	15	20	20	26	28	31	31	32.5
L25	15	15	19.5	19.5	25.5	27.5	30.5	30.5	32.5
L26	18.5	18.5	23	23	29.5	31.5	34.5	34.5	38
C1 ¹⁵	46	46	70	100	100	100	130	165	165
C2 ¹⁵	M4	M4	M5	M6	M6	M6	M8	M10	M10
C3 ¹⁵	≤ 12	≤ 12	≤ 16	≤ 24	≤ 24	≤ 24	≤ 32	≤ 38	≤ 38
C4 ¹⁵	30	30	34	40	40	40	50	60	60
C5 ¹⁵	30	30	50	80	80	80	110	130	130
C6 ¹⁶	3.5	3.5	8	4	4	4	5	6	6
C7 ¹⁶	42	42	60	92	92	92	115	142	142
C8 ¹⁶	21.5	21.5	21.5	20	20	20	24	31	31
C9 ¹⁶	161.5	181	210.5	252	304.5	347.5	440.5	510	559
C10 ¹⁶	14.5	14.5	15.5	13	13	13	16	21	21

HT-FC/HTB-FC (三节, 減速比 $i=75\sim500$) (Section III, reduction ratio $i = 75 \sim 500$)



*HTB 系列的尺寸与 HT 系列相同。(单位: mm) *The dimensions of HTB series are the same as those of HT series. (unit: mm)

尺寸	HT110FC	HT140FC	HT170FC	HT210FC	HT240FC	HT280FC
D1	M8	M10	M12	M16	M16	M16
D2 ^{h6}	22	32	40	50	55	60
D3 ^{h8}	25	44	50	62	68	75
D4 ^{h7}	108	135	165	205	235	275
D12	106	104	128	160	180	200
D14 ^{h7}	108	135	165	205	235	275
D15	107	106	130	158	178	198
D17	38	61	70	86	86	100
D18	50	80	90	110	115	138
L1	110	140	170	210	240	280
L2	18	24	26	29	29	30.5
L3	15	15	15	20	25	25
L4	2	2	2	2	2	2
L7	72	87	102	127	147	167
L8	95	116.5	133.5	161.5	181.5	205
L11	44	55	67	85	95	110
L13	15	15	15	20	25	25
L21	136.5	159.5	183.5	226	269	278
L22	191.5	229.5	268.5	331	389	418
L23	20	26	28	31	31	32.5
L24	20	26	28	31	31	32.5
L25	19.5	25.5	27.5	30.5	30.5	32.5
L26	23	29.5	31.5	34.5	34.5	38
C1 ¹⁶	46	46	70	70	100	100
C2 ¹⁶	M4	M4	M5	M5	M6	M6
C3 ¹⁶	≤ 12	≤ 12	≤ 16	≤ 16	≤ 24	≤ 24
C4 ¹⁶	30	30	34	34	40	40
C5 ¹⁶	30	30	50	50	80	80
C6 ¹⁶	3.5	3.5	8	8	4	4
C7 ¹⁶	42	42	60	60	92	92
C8 ¹⁶	21.5	21.5	21.5	21.5	20	20
C9 ¹⁶	21	321	375	375	529	578
C10 ¹⁶	14.5	14.5	15.5	15.5	13	13

