For stepper / servo motor

Planetary Gearbox

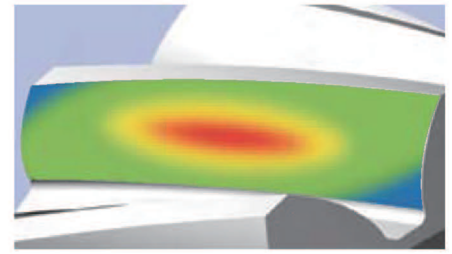
Taiwan excellent technology/precision transmission solutions expert

3F FAMED®

Fenghua Transmission Technology (Jiangsu) Co.,Ltd.

Product Technology

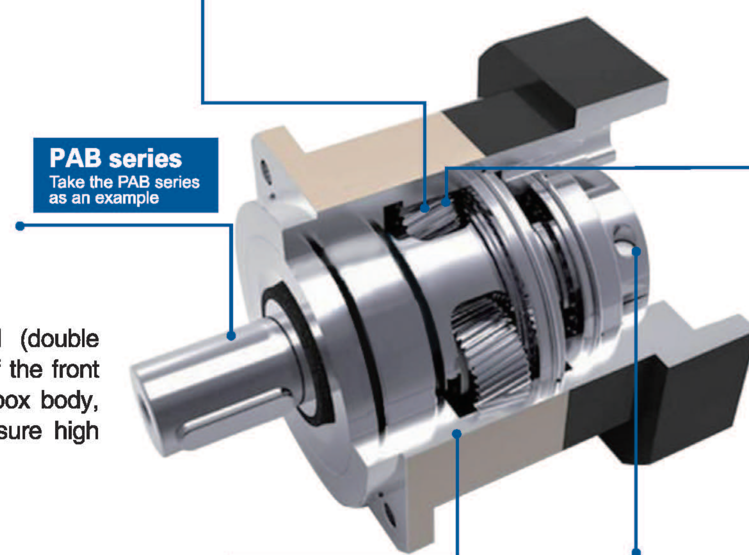
The 3F series planetary gearbox has two multi-national patent lubricating structure, which is used in the internal spiral gear structure to ensure the highest efficient output.
Patent 1: Reducing the axial thrust of the planetary gear operation.
Patent 2: Increase the lubrication, reduce the frictional resistance and noise.



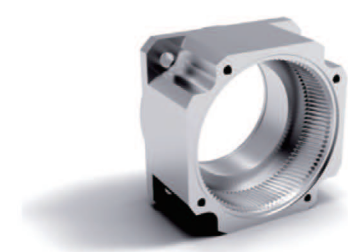
Finite element analysis of gear strength is carried out by using ANSYS technology. Tooth profile and lead trimming of tooth surface are also made to reduce the impact and noise of gear meshing, and increase the service life of gear system.

Carbon–nitriding heat–treated high quality alloy steel is adopted in gear materials to obtain the best wear resistance and impact toughness.

The output planet carrier adopts integral (double support) structure design. The large span of the front and rear bearings is distributed inside the box body, forming a stable integrated structure to ensure high torsion rigidity and accuracy.



An integrated design of the tooth ring and the output shell is adopted, and high quality steel is used to get high material density by hot forging. The integrated design can ensure that all geometric dimensions are finished in one time and have higher precision and strength compared with other embedded and clamped structures.



The input shaft and locking device are designed in an integrated way. The two bolts are symmetrically distributed to achieve dynamic balance. At the same time, through the strong locking of double bolts, the motor shaft transmission is effectively prevented from slipping and the high–precision zero backlash power transmission is achieved.

Reference Table of Reducer Selection

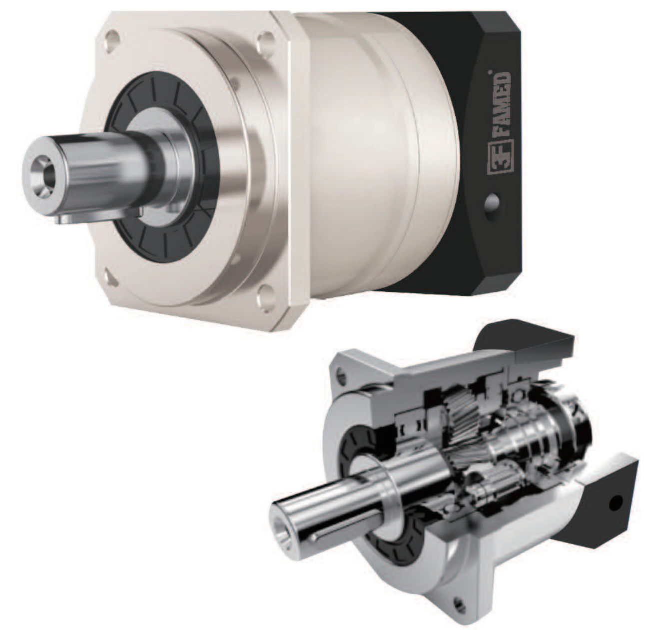
Selecting reducer according to the output power of servo motor

Capacity	Model	1/3	1/4	1/5	1/7	1/10	1/12	1/15	1/16	1/20	1/25	1/28	1/30	1/35	1/40	1/50	1/70	1/100
100w	042	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	060	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
200w	060	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	090	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
400w	060	●	●	●	●	●	●	●	●	●	●	●	●					
	090	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
500w	090	●	●	●	●	●	●	●	●	●	●	●						
	120	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
750w	090	●	●	●	●	●	●	●	●	●	●	●						
	120	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1.0kw	090	●	●	●	●	●												
	120	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	150	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
1.5kw	090	●	●	●	●	●												
	120	●	●	●	●	●	●	●	●	●	●	●	●					
	150	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
2.0kw	120	●	●	●	●	●	●	●										
2.0kw	150	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	180	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
3.5kw	120	●	●	●	●	●	●	●										
3.5kw	150	●	●	●	●	●	●	●	●	●	●	●	●	●				
	180	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	220	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
5.0kw	120	●	●	●	●	●	●	●										
5.0kw	150	●	●	●	●	●	●	●	●	●	●	●						
	180	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	220	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
7.0kw	180	●	●	●	●	●	●	●	●	●								
	220	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
11.0kw	180	●	●	●	●	●												
	220	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
15.0kw	220	●	●	●	●	●	●	●	●	●	●							

P.S : This mark"●"means available reduction ratio.
Note 1 : Three-stage speed reduction ratios are not available in the above stable. If needed, pls inform our sales person.
Note 2 : Choose a bigger level of reducer to use when the inertia is bigger.

PRECISION PLANETARY GEARBOX

VRB



- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 3.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

VRB Type

VRB090 – 10 – S1 – P1 / Motor

Reducer Model
VRB042, VRB060, VRB090, VRB115
VRB142, VRB180, VRB220

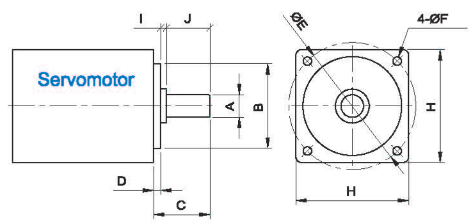
Output Shaft Keyway
S1:(Solid Output Shaft No Keyway)
S2: Standard (Keyway)
S3: Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1-stage: 3, 4, 5, 6, 7, 8, 9, 10
2-stage: 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100

Backlash Grade
P0: High precision backlash
P1: Precision backlash
P2: Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions:



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

VRB Reducer Specifications

Specs	Unit	Stage	Ratio	VRB042	VRB060	VRB090	VRB115	VRB142	VRB180	VRB220
Rated Output Torque / T2N	Nm	1	3	20	55	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
			9	14	40	100	230	450	900	1500
			10	14	40	100	230	450	900	1500
		2	15	20	55	130	208	342	588	1140
			20	19	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			30	22	55	130	208	342	588	1140
			35	22	60	160	330	650	1200	2000
			40	22	50	140	298	542	1050	1700
			45	14	40	100	230	450	900	1500
			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
			90	14	40	100	230	450	900	1500
			100	14	40	100	230	450	900	1500
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque						
Rated Input Speed / n_{1N}	rpm	1,2	3~100	5000	5000	4000	4000	3000	3000	2000
Max.Input Speed / n_{1B}	rpm	1,2	3~100	10000	10000	8000	8000	6000	6000	4000
Micro Backlash P0	arcmin	1	3~10	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	12~100	≤3	≤3	≤3	≤3	≤3	≤3	≤3
Precision Backlash P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	12~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Precision Backlash P2	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	780	1530	3250	6700	9400	14500	50000
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	390	765	1625	3350	4700	7250	25000
Service Life	hr	1,2	3~100	20000h						
Efficiency / η	%	1	3~10	≥97%						
		2	15~100	≥94%						
Weight	kg	1	3~10	0.5	1.3	3.3	7.8	15	28	52
		2	15~100	0.8	1.48	3.9	9.6	18.9	33	66
Operating Temperature	℃	1,2	3~100	(−15℃ ~ +90℃)						
Lubrication		1,2	3~100	(Synthetic Grease)						
Protection Class		1,2	3~100	IP65						
Mounting Position		1,2	3~100	(Any Direction)						
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

Reducer Rotary Inertia

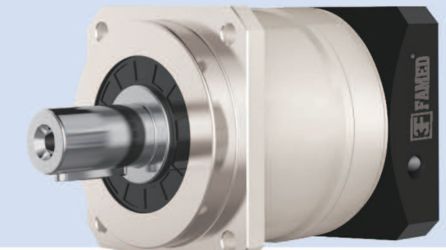
Specs	Unit	Stage	Ratio	VRB042	VRB060	VRB090	VRB115	VRB142	VRB180	VRB220
Rotary Inertia	$kg.cm^2$	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
			9	0.03	0.13	0.44	2.57	7.04	22.53	50.63
			10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
		2	12–40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			50–100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

1. Ratio (i=Nin/Nout) 2. When output speed is 100rpm, acting on the output shaft center position
3. The Max. acceleration torque T2B=60% of T2NOT, continuous operation, service life is 10000hrs

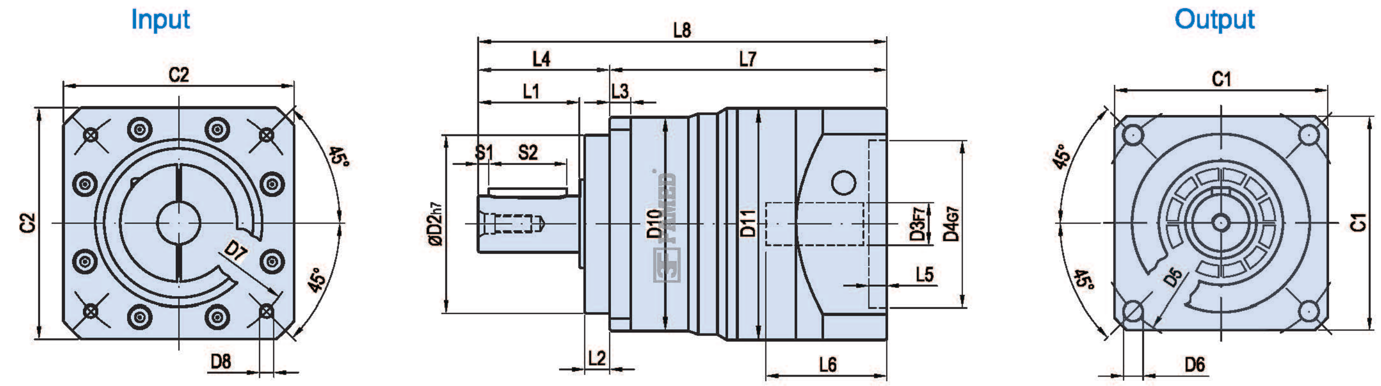
MODEL: VRB

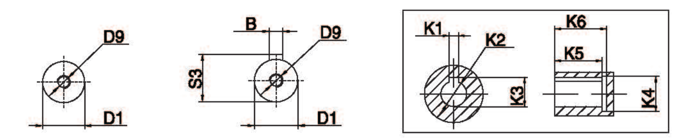
1–Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10



Dimensions:





Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

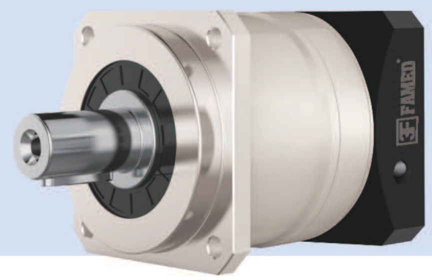
Size	VRB042–L1	VRB060–L1	VRB090–L1	VRB115–L1	VRB142–L1	VRB180–L1	VRB220–L1
D1	ϕ13	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75
D2	ϕ35	ϕ50	ϕ80	ϕ110	ϕ130	ϕ160	ϕ180
D3	ϕ8 (ϕ6.35–11)	ϕ14 (ϕ11–19)	ϕ19 (ϕ16–24)	ϕ22 (ϕ19–35)	ϕ24 (ϕ22–35)	ϕ35 (ϕ35–42)	ϕ42 (ϕ35–55)
D4	ϕ30 (ϕ30–50)	ϕ50 (ϕ50– ϕ70)	ϕ70 (ϕ70– ϕ110)	ϕ110 (ϕ114.3)	ϕ110 (ϕ114.3)	ϕ114.3 (ϕ114.3–200)	ϕ180 (ϕ114.3–200)
D5	ϕ50	ϕ70	ϕ100	ϕ130	ϕ165	ϕ215	ϕ250
D6	4– ϕ3.4	4– ϕ5.5	4– ϕ7	4– ϕ9	4– ϕ11	4– ϕ13	4– ϕ17
D7	ϕ46 (ϕ45–70)	ϕ70 (ϕ70– ϕ90)	ϕ90 (ϕ90–145)	ϕ145 (ϕ145–200)	ϕ145 (ϕ145–200)	ϕ200 (ϕ200–235)	ϕ215 (ϕ200–235)
D8	4–M4(M3–M5)	4–M5 (M4–M6)	4–M6 (M5–M8)	4–M8 (M8–M12)	4–M8 (M8–M12)	4–M12	4–M12
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
D10	ϕ42	ϕ60	ϕ87	ϕ114.5	ϕ142	ϕ180	ϕ218
D11	ϕ46	ϕ65	ϕ90	ϕ118	ϕ150	ϕ184	ϕ225.5
L1	19.5	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	5	5	7 (7–8)	6 (6–11)	8 (8–11)	7 (7–10)	8 (8–15)
L6	27.5 (≤32)	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82)	85 (≤120)	109 (≤119)
L7	65.5 (65.5–70)	78 (78–88)	98 (98–114)	135 (135–153)	154.5 (154.5–164)	179 (179–214)	220 (220–230)
L8	91.5 (91.5–96)	115 (115–125)	146 (146–162)	201 (201–218)	251.5 (251.5–261)	284 (284–319)	358 (358–368)
C1	42	60	90	115	142	180	220
C2	46(46–60)	65(65–80)	90 (90–130)	130 (130–180)	130 (130–180)	180 (180–220)	200 (200–220)
S1	3	3	4	5	5	6	7
S2	14	22	28	40	65	70	90
S3	15	18	24.5	35	43	59	79.5
B	5	5	6	10	12	16	20
K1	–	4	6	8	10	14	18
K2	–	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50	ϕ60
K3	–	12.8	24.5	31.3	41.3	53.8	64.4
K4	–	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60	ϕ72
K5	–	15	20	27	35	43	60
K6	–	18	24	32	40	50	65

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

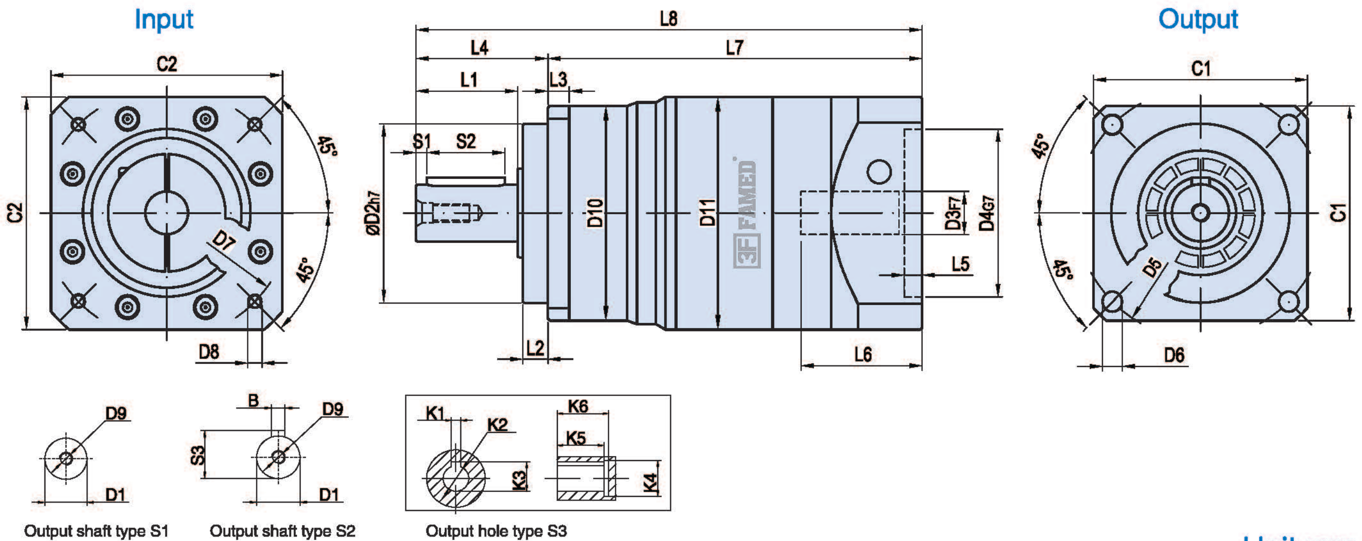
MODEL：VRB

2–Stage

Ratio：15，20，25，30，35，40，45，50，60
70，80，90，100



Dimensions：



Unit:mm

Size	VRB042–L2	VRB060–L2	VRB090–L2	VRB115–L2	VRB142–L2	VRB180–L2	VRB220–L2
D1	ϕ13	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75
D2	ϕ35	ϕ50	ϕ80	ϕ110	ϕ130	ϕ160	ϕ180
D3	ϕ8 (ϕ6.35–8)	ϕ14 (ϕ11–14)	ϕ19 (ϕ11–19)	ϕ22 (ϕ16–24)	ϕ24 (ϕ19–35)	ϕ35 (ϕ22–35)	ϕ42 (ϕ35–42)
D4	ϕ30 (ϕ30–38.1)	ϕ50	ϕ70 (ϕ50–ϕ80)	ϕ110 (ϕ70–110)	ϕ110 (ϕ114.3)	ϕ114.3 (ϕ110–114.3)	ϕ180 (ϕ114.3–200)
D5	ϕ50	ϕ70	ϕ100	ϕ130	ϕ165	ϕ215	ϕ250
D6	4–ϕ3.4	4–ϕ5.5	4–ϕ7	4–ϕ9	4–ϕ11	4–ϕ13	4–ϕ17
D7	ϕ46 (ϕ45–66.67)	ϕ70	ϕ90 (ϕ70–100)	ϕ145 (ϕ90–145)	ϕ145 (ϕ145–200)	ϕ200 (ϕ145–200)	ϕ215 (ϕ200–235)
D8	4–M4(M3)	4–M5 (M4)	4–M6 (M4–M6)	4–M8 (M5–M8)	4–M8 (M8–M12)	4–M12 (M8–M12)	4–M12
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
D10	ϕ42	ϕ60	ϕ87	ϕ114.5	ϕ142	ϕ180	ϕ218
D11	ϕ46	ϕ65	ϕ90	ϕ118	ϕ150	ϕ184	ϕ225.5
L1	19.5	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	5	5	5	8 (7–8)	11 (6–11)	8 (8–11)	8 (7–10)
L6	27.5	34	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82	85 (≤120)
L7	86	105	124.5 (114.5–124.5)	165.5 (149.5–165.5)	206 (189–206)	235 (225.5–235)	269 (264–299)
L8	112	142	172.5 (162.5–172.5)	230.5 (214.5–230.5)	303 (286–303)	340 (330.5–340)	407 (402–437)
C1	42	60	90	115	142	180	220
C2	46 (46–57)	65	65 (65–86)	90 (90–130)	130 (130–180)	150 (150–180)	200 (180–220)
S1	3	3	4	5	5	6	7
S2	14	22	28	40	65	70	90
S3	15	18	24.5	35	43	59	79.5
B	5	5	6	10	12	16	20
K1	–	4	6	8	10	14	18
K2	–	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50	ϕ60
K3	–	12.8	24.5	31.3	41.3	53.8	64.4
K4	–	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60	ϕ72
K5	–	15	20	27	35	43	60
K6	–	18	24	32	40	50	65

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
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Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

PRECISION PLANETARY GEARBOX

EVB

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Model Selection of Speed Reducers

EVB Type

EVB090 – 10 – S1 – P1 / Motor

Reducer Model
EVB042，EVB060，EVB090，EVB115
EVB142，EVB180，EVB220

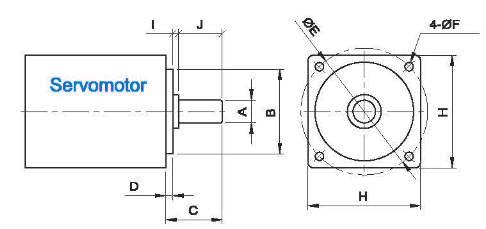
Output Shaft Keyway
S1:(Solid Output Shaft No Keyway)
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3，4，5，6，7，8，9，10，14，16，20
2–stage：15，20，25，30，35，40，50，70，
80，100，120，140，160，180，200

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

Reducer Specifications

Specs	Unit	Stage	Ratio	EVB042	EVB060	EVB090	EVB115	EVB142	EVB180	EVB220
Rated Output Torque / T2N	Nm	1	3	20	55	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	50	140	290	542	1050	1700
			9	14	40	100	230	450	900	1500
			10	14	60	160	330	650	1200	2000
			14	19	50	140	300	550	1100	1800
			20	14	40	100	230	450	900	1500
		2	15	20	55	130	208	342	588	1140
			20	20	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			30	22	55	130	208	342	588	1140
			35	22	60	160	330	650	1200	2000
			40	22	50	140	290	542	1050	1700
			50	22	60	160	330	650	1200	2000
			70	22	60	160	330	600	1200	2000
			80	22	50	140	290	542	1050	1700
			100	22	60	160	330	650	1200	2000
			120	—	—	150	310	600	1100	1900
			140	—	—	140	300	550	1100	1800
			160	—	—	120	260	500	1000	1600
			180	—	—	98	225	445	895	1495
			200	—	—	100	230	450	900	1500
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~200	3Times of Nominal Output Torque						
Rated Input Speed / n_{1N}	rpm	1,2	3~200	3000	3000	3000	3000	2500	2000	2000
Max.Input Speed / n_{1B}	rpm	1,2	3~200	6000	6000	6000	5500	4500	4500	4000
Precision Backlash P0	arcmin	1	3~20	≤2	≤2	≤2	≤2	≤2	≤2	≤2
		2	15~200	≤4	≤4	≤4	≤4	≤4	≤4	≤4
Precision Backlash P1	arcmin	1	3~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	15~200	≤6	≤6	≤6	≤6	≤6	≤6	≤6
Standard Backlash P2	arcmin	1	3~20	≤6	≤6	≤6	≤6	≤6	≤6	≤6
		2	15~200	≤8	≤8	≤8	≤8	≤8	≤8	≤8
Torsional Rigidity	Nm/arcmin	1,2	3~200	3	6	14	25	56	140	220
Max.Radial Force / F_{2rB}[2]	N	1,2	3~200	780	1300	3200	6750	9400	14500	50000
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~200	330	700	1580	3300	4700	7200	28000
Service Life	hr	1,2	3~200	21000 h						
Efficiency / η	%	1	3~20	≥93%						
		2	25~200	≥90%						
Weight	kg	1	3~20	0.9	1.5	6.4	13	24.5	51	83
		2	25~200	1.2	2.1	7.8	14.2	27.5	54	95
Operating Temperature	℃	1,2	3~200	(–15℃ ~ +90℃)						
Lubrication		1,2	3~200	(Synthetic Grease)						
Protection Class		1,2	3~200	IP65						
Mounting Position		1,2	3~200	(Any Direction)						
Noise Level (n1=3000rpm，No load)	dB(A)	1,2	3~200	≤65	≤65	≤68	≤68	≤70	≤72	≤74

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	EVB042	EVB060	EVB090	EVB115	EVB142	EVB180	EVB220
Moment of Inertia	$kg.cm^2$	1	3~10	0.09	0.35	2.25	6.84	23.4	68.9	135.4
			14~20	0.03	0.07	1.87	6.25	21.8	65.6	119.8
		2	15~100	0.09	0.09	0.35	2.25	6.84	23.4	68.9
			120~200	—	—	0.31	1.87	6.25	21.8	65.6

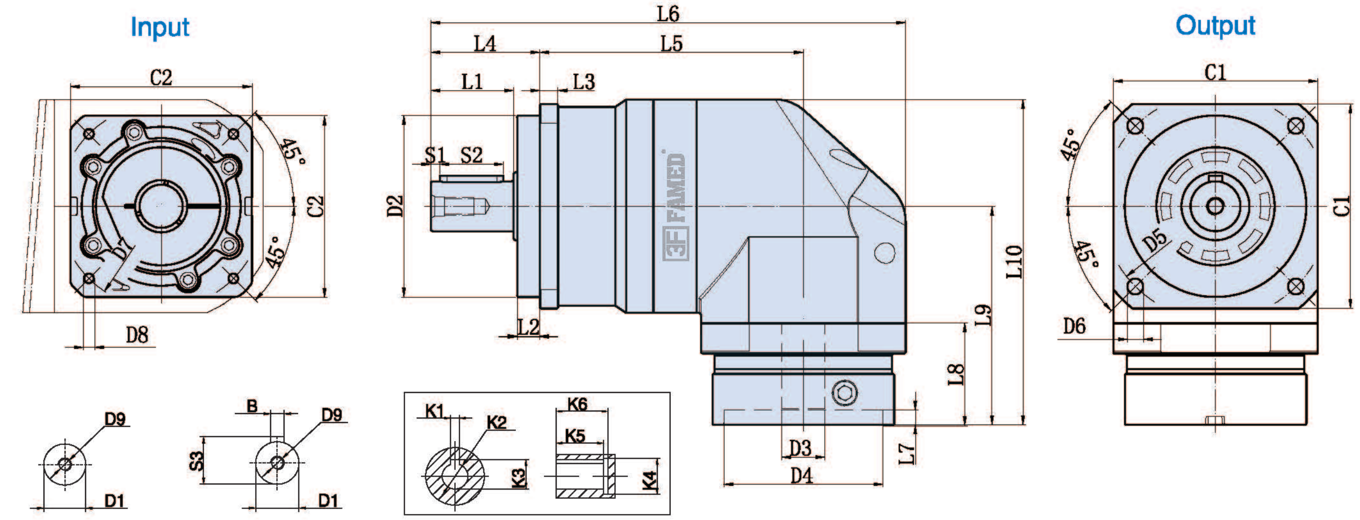
1. The Max. acceleration torque T2B=60% of T2NOT　2. When output speed is 100rpm, inertia acts on the output shaft center position.
3. 3-stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

MODEL：EVB

1–Stage

Ratio：3，4，5，6，7，8，9，10，14，16，20

Dimensions：



Output shaft type S1　Output shaft type S2　Output hole type S3

Unit:mm

Size	EVB042–L1	EVB060–L1	EVB090–L1	EVB115–L1	EVB142–L1	EVB180–L1	EVB220–L1
D1	ϕ13	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75
D2	ϕ35	ϕ50	ϕ80	ϕ110	ϕ130	ϕ160	ϕ180
D3	ϕ8(≤11)	ϕ14(≤14)	ϕ19(≤24)	ϕ24(≤32)	ϕ35(≤42)	ϕ38(≤50)	ϕ55(≤55)
D4	ϕ30(30–50)	ϕ50（50–70）	ϕ70（50–110）	ϕ110（50–130）	ϕ114.3(95–180)	ϕ180(95–180)	ϕ215(180–255)
D5	ϕ50	ϕ70	ϕ100	ϕ130	ϕ165	ϕ215	ϕ250
D6	4–ϕ3.4	4–ϕ5.5	4–ϕ7	4–ϕ9	4–ϕ11	4–ϕ13	4–ϕ17
D7	ϕ46(22–70)	ϕ70（70–130）	ϕ90（70–145）	ϕ145（70–145）	ϕ200(90–215)	ϕ200(90–300)	ϕ235(200–300)
D8	(4–M3X8L)	(4–M4*8L)	(4–M6*10L)	(4–M8*20L)	(4–M12X30L)	(4–M12X30L)	(4–M12X30L)
D9	M4X0.7P	M5*0.8P*18L	M6*1.25P*19L	M12*1.75P*28L	M16X2.0P	M20X2.5P	M20X2.5P
L1	19	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	96	86	116	137.5	255	289	346
L6	(122)	153	209	260	(352)	(394)	(484)
L7	(3.5)	(5)	(6.5)	(10)	(14)	(15)	(7)
L8	(30)	(33)	(45)	(64)	(81)	(85)	(85)
L9	(69.5)	(77.5)	(96)	(135.5)	(165)	(213.5)	(268.5)
L10	(95.5)	(111.75)	(143)	(195)	(230)	(303.5)	(378.5)
C1	□42	□60	□90	□115	□142	□180	□220
C2	(□42)	(□60)	(□80)	(□130)	(□142)	(□180)	(□220)
S1	2	3	4	5	5	5	7
S2	16	22	28	40	65	70	90
S3	15	18	24.5	35	43	59	79
B	5	5	6	10	12	16	20
K1	–	3	6	8	10	14	16
K2	–	ϕ8	ϕ18	ϕ28	ϕ38	ϕ50	ϕ60
K3	–	9.2	21	31.3	42	53.8	64.4
K4	–	ϕ11	ϕ24	ϕ38	ϕ48	ϕ60	ϕ72
K5	–	16	30	27	35	43	60
K6	–	18	35	32	40	50	65

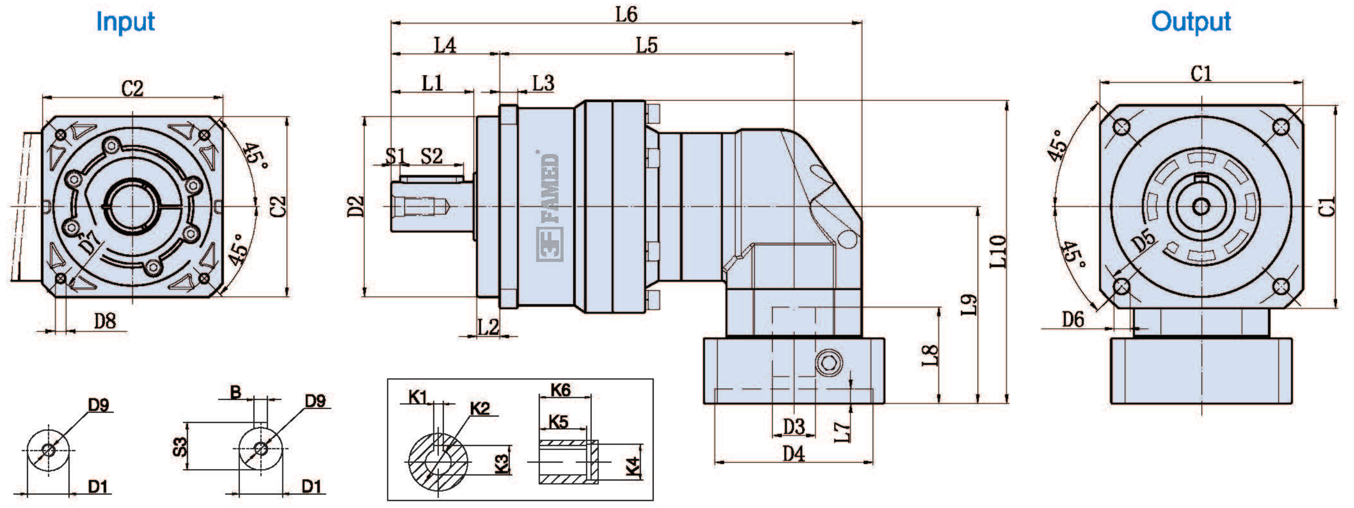
Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL：EVB

2–Stage

Ratio：15，20，25，30，35，40，50，70，80
100，120，140，160，180，200

Dimensions：



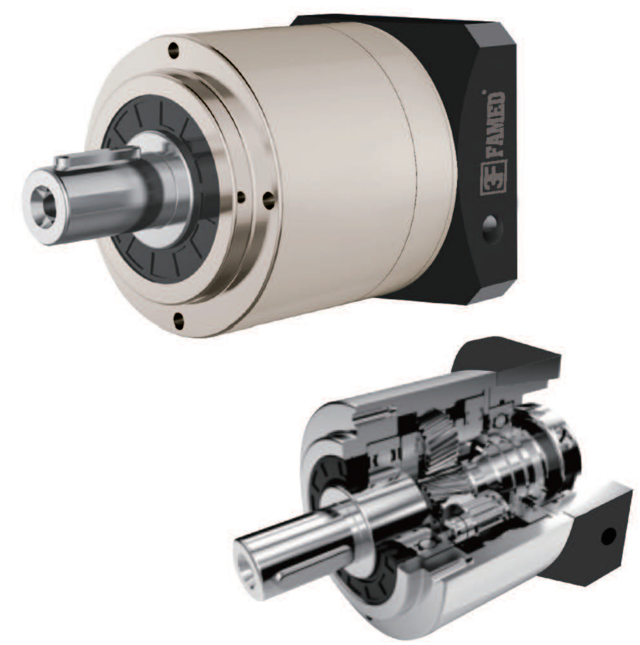
Unit:mm

Size	EVB042–L2	EVB060–L2	EVB090–L2	EVB115–L2	EVB142–L2	EVB180–L2	EVB220–L2
D1	ϕ13	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75
D2	ϕ35	ϕ50	ϕ80	ϕ110	ϕ130	ϕ160	ϕ180
D3	ϕ8(≤11)	ϕ14(≤14)	ϕ19(≤24)	ϕ24(≤32)	ϕ35(≤42)	ϕ38(≤50)	ϕ55(≤55)
D4	ϕ30(30–50)	ϕ50（50–70）	ϕ70（50–110）	ϕ110（50–130）	ϕ114.3(95–180)	ϕ180(95–180)	ϕ215(180–255)
D5	ϕ50	ϕ70	ϕ100	ϕ130	ϕ165	ϕ215	ϕ250
D6	4–ϕ3.4	4–ϕ5.5	4–ϕ7	4–ϕ9	4–ϕ11	4–ϕ13	4–ϕ17
D7	ϕ46(22–70)	ϕ70（70–130）	ϕ90（70–145）	ϕ145（70–145）	ϕ200(90–215)	ϕ200(90–300)	ϕ235(200–300)
D8	(4–M3X8L)	(4–M4*8L)	(4–M6*10L)	(4–M8*20L)	(4–M12X30L)	(4–M12X30L)	(4–M12X30L)
D9	M4X0.7P	M5*0.8P*18L	M6*1.25P*19L	M12*1.75P*28L	M16X2.0P	M20X2.5P	M20X2.5P
L1	19	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	113	115	130.5	167.5	282	322	383
L6	139	182	208.5	277.5	(378)	(427)	(521)
L7	(3.5)	(5)	(6.5)	(10)	(14)	(15)	(7)
L8	(30)	(33)	(42.5)	(59)	(81)	(85)	(85)
L9	(69.5)	(77.5)	(87)	(120)	(165)	(213.5)	(268.5)
L10	(90.5)	(111.75)	(134)	(179.5)	(236)	(303.5)	(378.5)
C1	□42	□60	□90	□115	□142	□180	□220
C2	(□42)	(□60)	(□80)	(□130)	(□142)	(□180)	(□220)
S1	2	3	4	5	5	5	7
S2	16	22	28	40	65	70	90
S3	15	18	24.5	35	43	59	79
B	5	5	6	10	12	16	20
K1	–	3	6	8	10	14	16
K2	–	ϕ8	ϕ18	ϕ28	ϕ38	ϕ50	ϕ60
K3	–	9.2	21	31.3	42	53.8	64.4
K4	–	ϕ11	ϕ24	ϕ38	ϕ48	ϕ60	ϕ72
K5	–	20	30	27	35	43	60
K6	–	24	35	32	40	50	65

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

PRECISION PLANETARY GEARBOX

VRL



- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 3.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

VRL Type

VRL090 – 10 – S1 – P1 / Motor

Reducer Model
VRL050，VRL070，VRL090，VRL120
VRL155，VRL205，VRL235

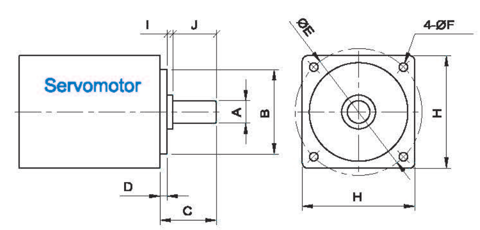
Output Shaft Keyway
S1:(Solid Output Shaft No Keyway)
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3，4，5，6，7，8，9，10
2–stage：15，20，25，30，35，40，45，50，
60，70，80，90，100

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type — Model — Ratio — Output Shaft Keyway — Backlash Class — MOTOR NO.

VRL Reducer Specifications

Specs	Unit	Stage	Ratio	VRL050	VRL070	VRL090	VRL120	VRL155	VRL205	VRL235
Rated Output Torque / T2N	Nm	1	3	20	55	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
			9	14	40	100	230	450	900	1500
			10	14	40	100	230	450	900	1500
		2	15	20	55	130	208	342	588	1140
			20	19	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			30	22	55	130	208	342	588	1140
			35	22	60	160	330	650	1200	2000
			40	22	50	140	298	542	1050	1700
			45	14	40	100	230	450	900	1500
			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
			90	14	40	100	230	450	900	1500
			100	14	40	100	230	450	900	1500
Max.Output Torque / T_{2NOT} [1]	Nm	1,2	3~100	3Times of Nominal Output Torque						
Rated Input Speed / n_{1N}	rpm	1,2	3~100	5000	5000	4000	4000	3000	3000	2000
Max.Input Speed / n_{1B}	rpm	1,2	3~100	10000	10000	8000	8000	6000	6000	4000
Micro Backlash P0	arcmin	1	3~10	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	15~100	≤3	≤3	≤3	≤3	≤3	≤3	≤3
Precision Backlash P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	15~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Precision Backlash P2	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	15~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225
Max.Radial Force / F_{2rB} [2]	N	1,2	3~100	680	1260	2880	6000	8200	12800	27800
Max.Axial Force / F_{2a1B} [2]	N	1,2	3~100	370	760	1580	3360	4660	7250	18500
Service Life	hr	1,2	3~100	20000h						
Efficiency / η	%	1	3~10	≥97%						
		2	15~100	≥94%						
Weight	kg	1	3~10	0.5	1.2	3.5	7.8	14.5	30	50
		2	15~100	0.8	1.4	4.1	9	17.5	33	63
Operating Temperature	℃	1,2	3~100	(-15℃ ~ +90℃)						
Lubrication		1,2	3~100	(Synthetic Grease)						
Protection Class		1,2	3~100	IP65						
Mounting Position		1,2	3~100	(Any Direction)						
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

Reducer Rotary Inertia

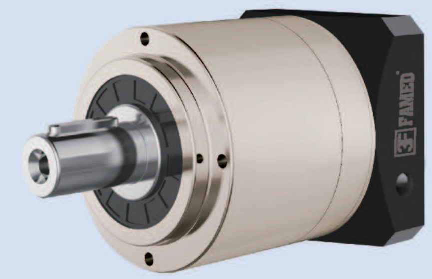
Specs	Unit	Stage	Ratio	VRL050	VRL070	VRL090	VRL120	VRL155	VRL205	VRL235
Moment of Inertia	$kg.cm^2$	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
			9	0.03	0.13	0.44	2.57	7.04	22.53	50.63
			10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
		2	12–40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			50–100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

1. Ratio (i=Nin/Nout) 2. Output revolutions 100rpm, acting on the output shaft center position.
3. The Max. acceleration torque T2B=60% of T2NOT, continuous operation, service life is 10000hrs.

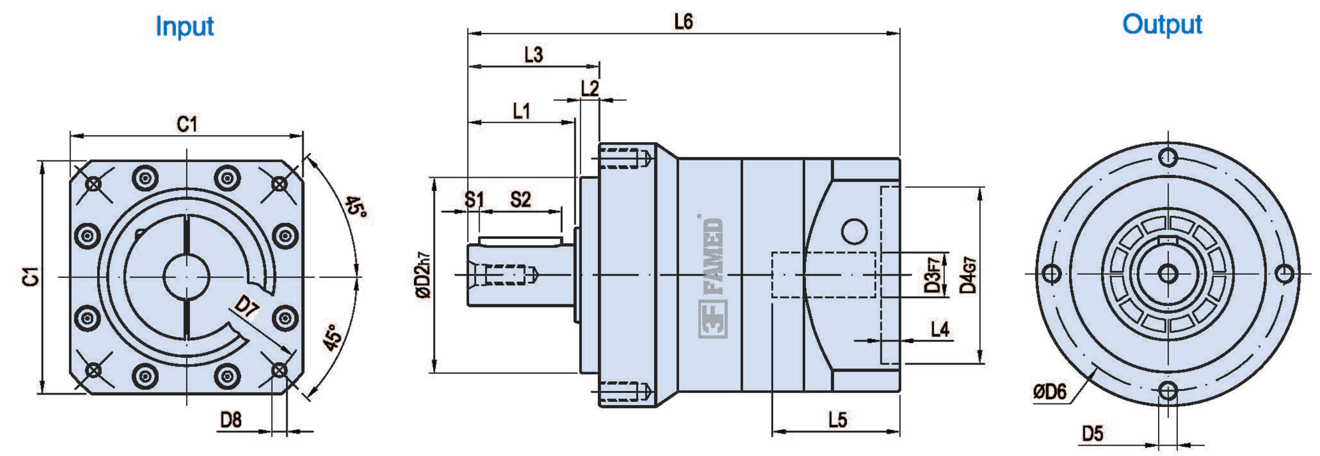
MODEL: VRL

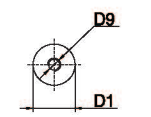
1–Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10

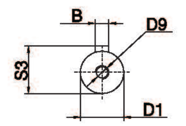


Dimensions:

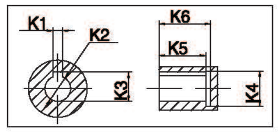




Output shaft type S1



Output shaft type S2



Output hole type S3

Unit:mm

Size	VRL070–L1	VRL090–L1	VRL120–L1	VRL155–L1	VRL205–L1	VRL235–L1
D1	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75
D2	ϕ52	ϕ68	ϕ90	ϕ120	ϕ160	ϕ180
D3	ϕ14 (ϕ11–14)	ϕ19 (ϕ16–24)	ϕ22 (ϕ19–35)	ϕ24 (ϕ22–35)	ϕ35 (ϕ35–ϕ42)	ϕ42 (ϕ35–55)
D4	ϕ50 (ϕ50–70)	ϕ70 (ϕ70–ϕ110)	ϕ110 (ϕ114.3)	ϕ110 (ϕ114.3)	ϕ114.3 (ϕ114.3–200)	ϕ180 (ϕ114.3~200)
D5	4–M5X10L	4–M6X12L	4–M8X16L	4–M10X20L	4–M12X22L	4–M16X28L
D6	ϕ62	ϕ80	ϕ108	ϕ140	ϕ184	ϕ210
D7	ϕ70 (ϕ70–90)	ϕ90 (ϕ90–145)	ϕ145 (ϕ145–200)	ϕ145 (ϕ145–200)	ϕ200 (ϕ200–235)	ϕ215 (ϕ200~235)
D8	4–M5 (M4–M6)	4–M6 (M5–M8)	4–M8 (M8–M12)	4–M8 (M8–M12)	4–M12	4–M12
D9	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
L1	28.5	36.5	51	79	82	105
L2	5	6	9	12	15	18
L3	35	44	62	94	100	126
L4	5	7~8	6~11	8~11	7~10	8~15
L5	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82)	85 (≤120)	109 (≤119)
L6	115 (115–125)	146 (146–162)	201 (201–218)	251.5 (251.5–261)	284 (284–319)	358 (358–368)
C1	65 (65–80)	90 (90–130)	130 (130–180)	150 (150–180)	180 (180–220)	200 (200–220)
S1	3	4	5	5	6	7
S2	22	28	40	65	70	90
S3	18	24.5	35	43	59	79.5
B	5	6	10	12	16	20
K1	4	6	8	10	14	18
K2	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50	ϕ60
K3	12.8	24.5	31.3	41.3	53.8	64.4
K4	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60	ϕ72
K5	15	20	27	35	43	60
K6	18	24	32	40	50	65

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL：VRL

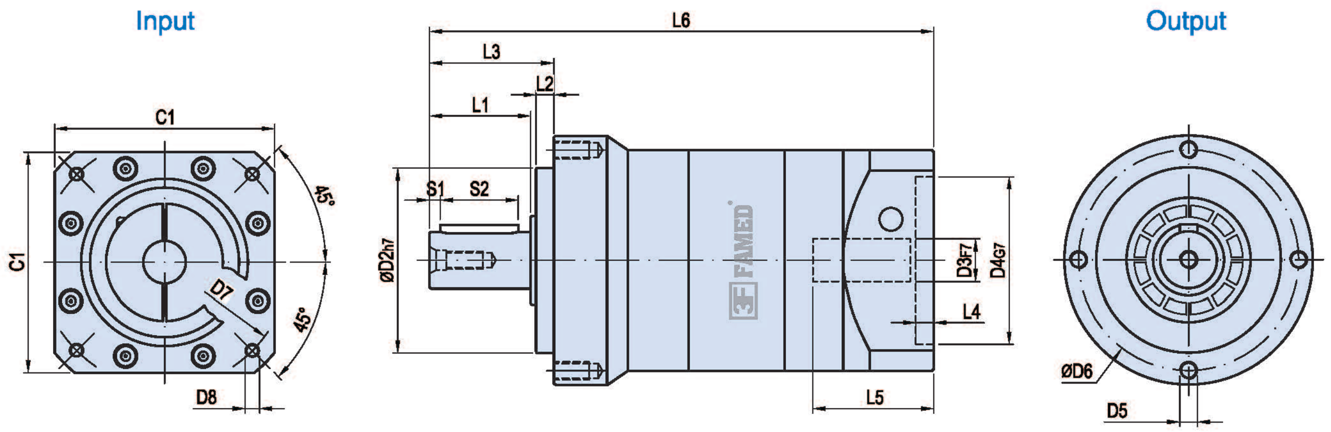
2-Stage

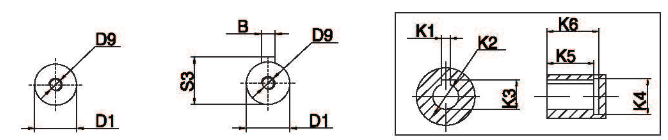
Ratio：15，20，25，30，35，40，45，50，
60，70，80，90，100

Dimensions：

Input

Output





Output shaft type S1　　Output shaft type S2　　Output hole type S3

Unit:mm

Size	VRL070-L1	VRL090-L2	VRL120-L2	VRL155-L2	VRL205-L2	VRL235-L2
D1	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75
D2	ϕ52	ϕ68	ϕ90	ϕ120	ϕ160	ϕ180
D3	ϕ14 (ϕ11-14)	ϕ19 (ϕ11-19)	ϕ22 (ϕ16-24)	ϕ24 (ϕ19-35)	ϕ35 (ϕ22-35)	ϕ42 (ϕ35-42)
D4	ϕ50	ϕ70 (ϕ50-ϕ80)	ϕ110 (ϕ70-ϕ110)	ϕ110 (ϕ114.3)	ϕ110 (ϕ114.3)	ϕ180 (ϕ114.3-200)
D5	4-M5X10L	4-M6X12L	4-M8X16L	4-M10X20L	4-M12X22L	4-M16X28L
D6	ϕ62	ϕ80	ϕ108	ϕ140	ϕ184	ϕ210
D7	ϕ70	ϕ90 (ϕ70-100)	ϕ145 (ϕ90-145)	ϕ145 (ϕ145-200)	ϕ145 (ϕ145-200)	ϕ215 (ϕ200-235)
D8	4-M5 (M4)	4-M6 (M4-M6)	4-M8 (M5-M8)	4-M8 (M8-M12)	4-M8 (M8-M12)	4-M12
D9	M5X0.8P	M8X1.25P	M12X1.75P	M16X2P	M20X2.5P	M20X2.5P
L1	28.5	36.5	51	79	82	105
L2	5	6	9	12	15	18
L3	35	44	62	94	100	126
L4	5	5	8 (7-8)	11 (6-11)	8 (8-11)	8 (7-10)
L5	34	34 (≤44)	44 (≤60)	64.5 (≤81.5)	72.5 (≤82)	85 (≤120)
L6	142	172.5 (162.5-172.5)	230.5 (214.5-230.5)	286 (286-303)	340 (330.5-340)	407 (402-437)
C1	65	80 (65-86)	130 (90-130)	130 (130-180)	150 (150-180)	200 (180-220)
S1	3	4	5	5	6	7
S2	22	28	40	65	70	90
S3	18	24.5	35	43	59	79.5
B	5	6	10	12	16	20
K1	4	6	8	10	14	18
K2	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50	ϕ60
K3	12.8	24.5	31.3	41.3	53.8	64.4
K4	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60	ϕ72
K5	15	20	27	35	43	60
K6	18	24	32	40	50	65

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

PRECISION PLANETARY GEARBOX

EVL

- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 3.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

EVL Type

EVL090 – 10 – S1 – P1 / Motor

Reducer Model
EVL070，EVL090，EVL120
EVL145，EVL180

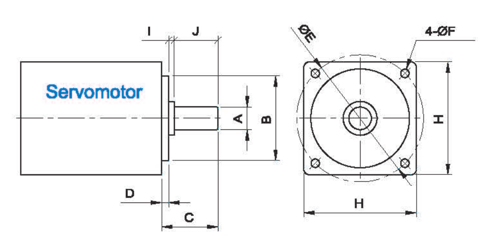
Output Shaft Keyway
S1:(Solid Output Shaft No Keyway)
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1-stage：3，4，5，6，7，8，9，10
2-stage：15，20，25，30，35，40，45，50，
60，70，80，90，100

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

EVL Reducer Specifications

Specs	Unit	Stage	Ratio	EVL070	EVL090	EVL120	EVL145	EVL180
Rated Output Torque / T2N	Nm	1	3	55	130	208	342	588
			4	50	140	290	542	1050
			5	60	160	330	650	1200
			6	55	150	310	600	1100
			7	50	140	300	550	1100
			8	50	140	290	542	1050
			9	40	100	230	450	900
			10	60	160	330	650	1200
			14	50	140	300	550	1100
			20	40	100	230	450	900
		2	15	55	130	208	342	588
			20	50	140	290	542	1050
			25	60	160	330	650	1200
			30	55	130	208	342	588
			35	60	160	330	650	1200
			40	50	140	290	542	1050
			50	60	160	330	650	1200
			70	60	160	330	600	1200
			80	50	140	290	542	1050
			100	60	160	330	650	1200
			120	—	150	310	600	1100
			140	—	140	300	550	1100
			160	—	120	260	500	1000
			180	—	98	225	445	895
			200	—	100	230	450	900
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~200	3Times of Nominal Output Torque				
Rated Input Speed / n_{1N}	rpm	1,2	3~200	3000	3000	3000	2500	2000
Max.Input Speed / n_{1B}	rpm	1,2	3~200	6000	6000	5500	4500	4500
Precision Backlash P0	arcmin	1	3~20	≤2	≤2	≤2	≤2	≤2
		2	15~200	≤4	≤4	≤4	≤4	≤4
Precision Backlash P1	arcmin	1	3~20	≤4	≤4	≤4	≤4	≤4
		2	15~200	≤6	≤6	≤6	≤6	≤6
Standard Backlash P2	arcmin	1	3~20	≤6	≤6	≤6	≤6	≤6
		2	15~200	≤8	≤8	≤8	≤8	≤8
Torsional Rigidity	Nm/arcmin	1,2	3~200	6	14	25	56	140
Max.Radial Force / F_{2rB}[2]	N	1,2	3~200	1300	3200	6750	9400	14500
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~200	700	1580	3300	4700	7200
Service Life	hr	1,2	3~200	21000 h				
Efficiency / η	%	1	3~20	≥93%				
		2	25~200	≥90%				
Weight	kg	1	3~20	1.5	6.4	13	24.5	51
		2	25~200	2.1	7.8	14.2	27.5	54
Operating Temperature	℃	1,2	3~200	(-15℃ ~ +90℃)				
Lubrication		1,2	3~200	(Synthetic Grease)				
Protection Class		1,2	3~200	IP65				
Mounting Position		1,2	3~200	(Any Direction)				
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~200	≤65	≤68	≤68	≤70	≤72

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	EVL070	EVL090	EVL120	EVL145	EVL180
Moment of Inertia	$kg.cm^2$	1	3~10	0.35	2.25	6.84	23.4	68.9
			14~20	0.07	1.87	6.25	21.8	65.6
		2	15~100	0.09	0.35	2.25	6.84	23.4
			120~200	—	0.31	1.87	6.25	21.8

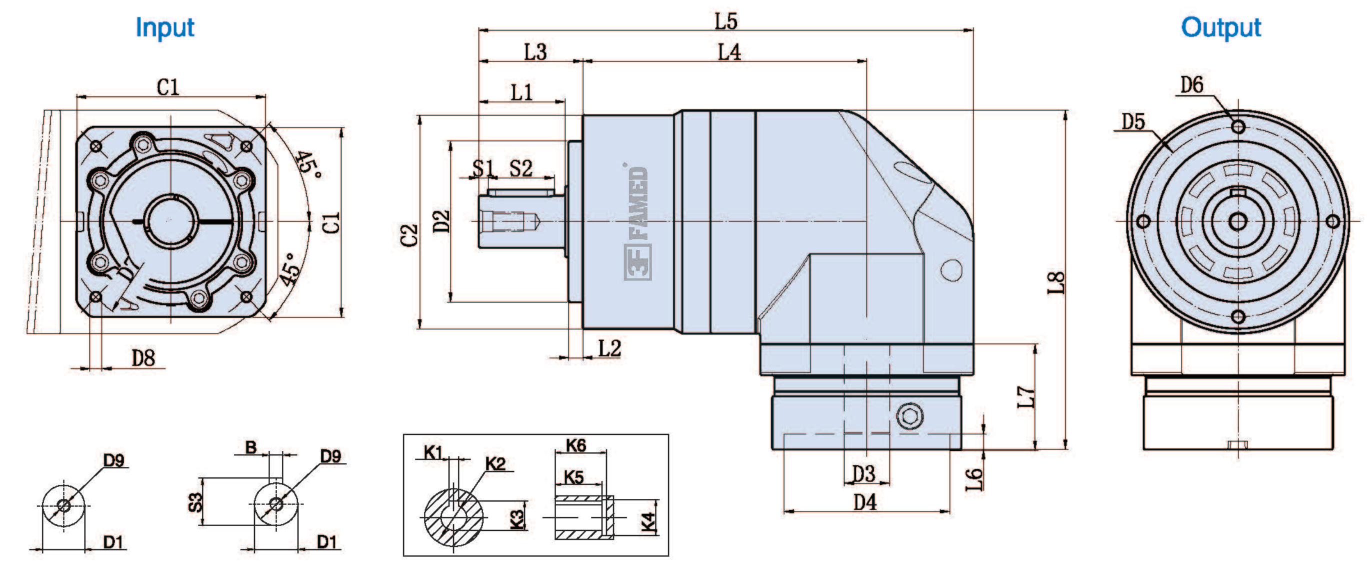
1. The Max. acceleration torque T2B=60% of T2NOT 2. When output speed is 100rpm, inertia acts on the output shaft center position.
3. 3-stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

MODEL: EVL

1-Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10

Dimensions:



Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

Size	EVL070-L1	EVL090-L1	EVL120-L1	EVL145-L1	EVL180-L1
D1	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55
D2	ϕ52	ϕ68	ϕ90	ϕ120	ϕ160
D3	ϕ14 (≤19)	ϕ19(11-24)	ϕ24(16-24)	ϕ24 (≤42)	ϕ35 (≤55)
D4	ϕ50 (50-70)	ϕ70 (50-110)	ϕ110 (50-110)	ϕ110 (≤180)	ϕ114.3 (≤180)
D5	ϕ62	ϕ80	ϕ108	ϕ140	ϕ184
D6	4-M5*10	4-M6*12	4-M8*16	4-M10*20L	4-M12*30L
D7	ϕ70 (70-130)	ϕ90 (70-145)	ϕ145 (90-155)	ϕ145 (≤215)	ϕ200 (≤300)
D8	(4-M4*10L)	(4-M5*12L)	(4-M8*20L)	(4-M12*30L)	(4-M12*30L)
D9	M5*0.8P*15L	M6*1.25P*19L	M12*1.75P*28L	M16*36L	M20*42L
L1	28.5	36.5	51	97	100
L2	5	6	9	79	84
L3	35	44	62	15	15
L4	88	120	140.5	172	294
L5	153	209	260	340	365
L6	(5)	(6.5)	(10)	(10)	(19)
L7	(33)	(45)	(64)	(84)	(81)
L8	(112.50)	(143)	(195.5)	(238)	(278)
C1	(□60)	(□80)	(□130)	(□130)	(□180)
C2	ϕ70	ϕ90	ϕ120	ϕ155	ϕ205
S1	3	4	5	5	6
S2	22	28	40	63	70
S3	18	24.5	35	43	59
B	5	6	10	12	16
K1	4	6	8	10	14
K2	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50
K3	12.8	24.5	31.3	42	53.8
K4	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60
K5	15	20	27	35	43
K6	18	24	32	40	50

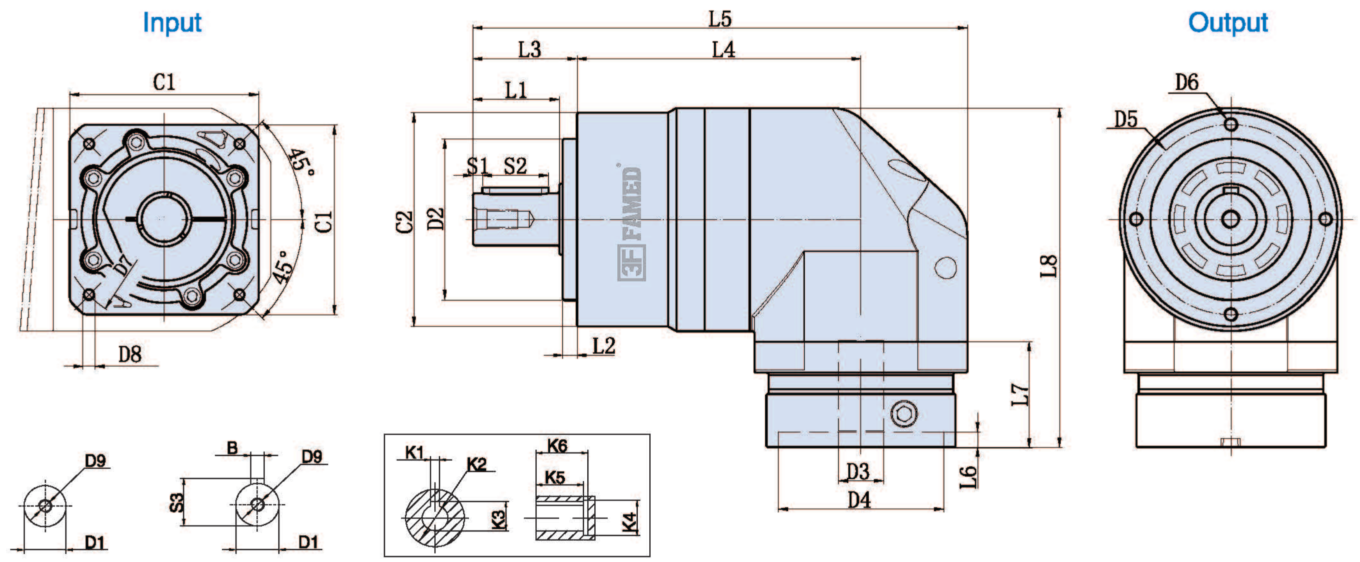
Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL：EVL

2–Stage

Ratio：15，20，25，30，35，40，45，50，
60，70，80，90，100

Dimensions：



Output shaft type S1 Output shaft type S2 Output hole type S3

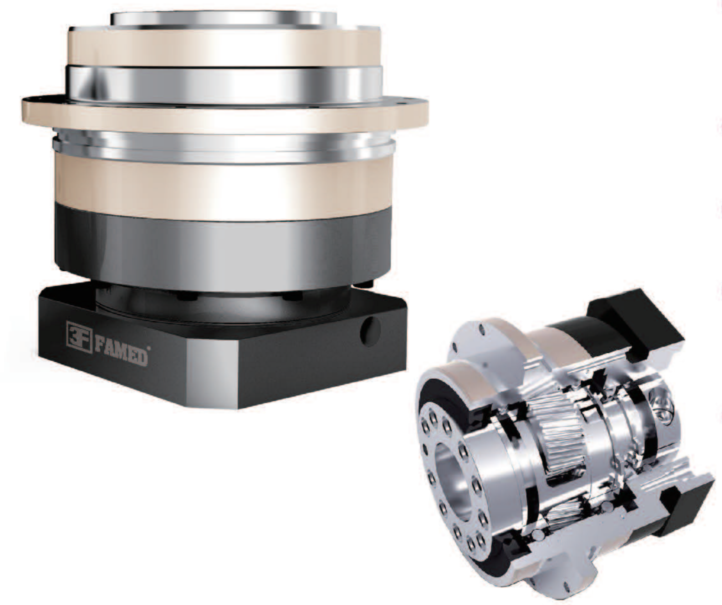
Unit:mm

Size	EVL070–L2	EVL090–L2	EVL120–L2	EVL145–L2	EVL180–L2
D1	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55
D2	ϕ52	ϕ68	ϕ90	ϕ120	ϕ160
D3	ϕ14（≤19）	ϕ19(11–24)	ϕ24(16–24)	ϕ24（≤42）	ϕ35（≤55）
D4	ϕ50（50–70）	ϕ70（50–110）	ϕ110（50–110）	ϕ110（≤180）	ϕ114.3（≤180）
D5	ϕ62	ϕ80	ϕ108	ϕ140	ϕ184
D6	4–M5*10	4–M6*12	4–M8*16	4–M10*20L	4–M12*30L
D7	ϕ70（70–130）	ϕ90（70–145）	ϕ145（90–155）	ϕ145（≤215）	ϕ200（≤300）
D8	（4–M4*10L)	（4–M5*12L)	（4–M8*20L)	（4–M12*30L)	（4–M12*30L)
D9	M5*0.8P*15L	M6*1.25P*19L	M12*1.75P*28L	M16*36L	M20*42L
L1	28.5	36.5	51	97	100
L2	5	6	9	79	84
L3	35	44	62	15	15
L4	117	134.5	170.5	233	362.5
L5	182	208.5	277.5	401	433.5
L6	(5)	(6.5)	(10)	(10)	(19)
L7	(33)	(42.5)	(59)	(84)	(81)
L8	(112.50)	(134)	(180)	(238)	(278)
C1	（□60）	（□80)	（□130)	（□130）	（□180）
C2	ϕ70	ϕ90	ϕ120	ϕ155	ϕ205
S1	3	4	5	5	6
S2	22	28	40	63	70
S3	18	24.5	35	43	59
B	5	6	10	12	16
K1	4	6	8	10	14
K2	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50
K3	12.8	24.5	31.3	42	53.8
K4	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60
K5	15	20	27	35	43
K6	18	24	32	40	50

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

High Precision Flange Output Planetray Gearbox

VRT



- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 3.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

VRT Type

VRT090 – 10 – S1 – P1 / Motor

Reducer Model
VRT047，VRT064，VRT090，VRT110
VRT140，VRT200，VRT255

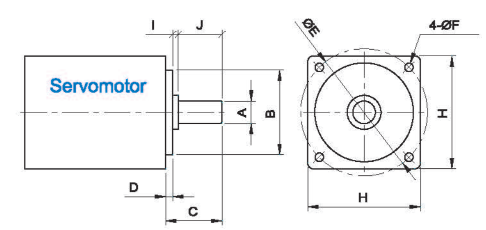
Output flange mode
S1：Standard flange face output
S2：Non standard flange face output

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3，4，5，6，7，8，9，10
2–stage：12，15，16，20，25，28，30，35，
40，50，70，80，100

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type – Model – Ratio – Output Shaft Keyway – Backlash Class – MOTOR NO.

VRT Reducer Specifications

Specs	Unit	Stage	Ratio	VRT047	VRT064	VRT090	VRT110	VRT140	VRT200	VRT255
Rated Output Torque / T2N	Nm	1	4	19	50	140	290	542	1050	1700
			5	22	60	160	330	650	1200	2000
			7	19	50	140	300	550	1100	1800
			10	14	40	100	230	450	900	1500
		2	20	22	60	140	290	542	1050	1700
			25	22	55	150	330	650	1200	2000
			35	22	55	160	330	650	1200	1800
			40	19	40	140	290	542	1050	1600
			50	22	55	160	330	650	1200	2000
			70	19	50	140	290	550	1100	1800
			100	14	40	100	230	450	900	1500
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	4~100	3Times of Nominal Output Torque						
Rated Input Speed / n_{1N}	rpm	1,2	4~100	5000	5000	4000	4000	3000	3000	2000
Max.Input Speed / n_{1B}	rpm	1,2	4~100	10000	10000	8000	8000	6000	6000	4000
Micro Backlash P0	arcmin	1	4~10	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	12~100	≤3	≤3	≤3	≤3	≤3	≤3	≤3
Precision Backlash P1	arcmin	1	4~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	20~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Standard Backlash P2	arcmin	1	4~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	20~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional Rigidity	Nm/arcmin	1,2	4~100	8	13	30	80	150	450	1010
Max.Radial Force / F_{2rB}[2]	N	1,2	4~100	43	125	235	430	1300	3064	5900
Max.Axial Force / F_{2a1B}[2]	N	1,2	4~100	990	1050	2850	2990	10590	16660	29430
Service Life	hr	1,2	4~100	22000h						
Efficiency / η	%	1	4~10	≥97%						
		2	20~100	≥94%						
Weight	kg	1	4~10	0.7	1.3	3.2	5.8	12.3	33	57.9
		2	20~100	1	1.5	4.1	7.6	16.8	38	72.6
Operating Temperature	℃	1,2	4~100	(-15℃ ~ +90℃)						
Lubrication		1,2	4~100	(Synthetic Grease)						
Protection Class		1,2	4~100	IP65						
Mounting Position		1,2	4~100	(Any Direction)						
Noise Level (n1=3000rpm，No load)	dB(A)	1,2	4~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

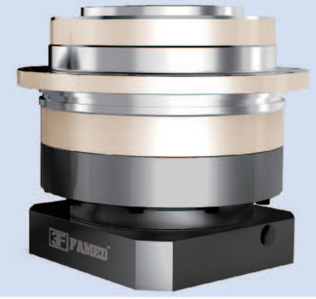
Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	VRT047	VRT064	VRT090	VRT110	VRT140	VRT200	VRT255
Moment of Inertia	kg.cm^2	1	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
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
		2	20-40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			50-100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

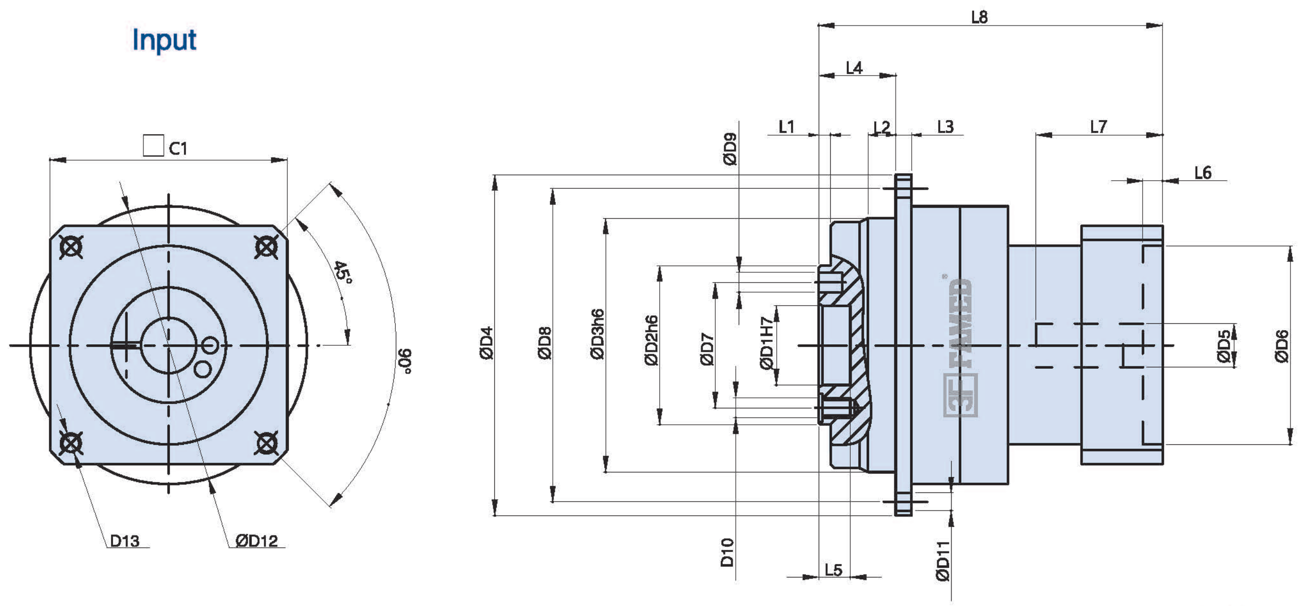
1. Max. reduction ratio(i=Nin/Nout)　2.The Max. acceleration torque T2B=60% of T2NOT
3. When output speed is 100rpm, acting on the output shaft center position，*Continuous operation, service life is 15000hrs。

MODEL：VRT

1-Stage
Ratio：3，4，5，6，7，8，9，10



Dimensions：



Unit:mm

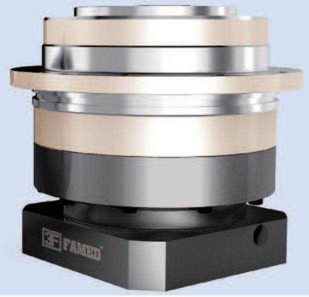
Size	VRT047-L1	VRT064-L1	VRT090-L1	VRT110-L1	VRT140-L1	VRT200-L1	PAD255-L1
D1	12	20	31.5	40	50	80	100
D2	28	40	63	80	100	160	180
D3	47	64	90	110	140	200	255
D4	72	86	118	145	179	247	300
D5	≤11/≤12	11(8 ~ 14)	19(14 ~ 22)	24(22 ~ 28)	24(24 ~ 48)	35(35 ~ 48)	48(48 ~ 55)
D6	30	30(30 ~ 50)	50(50 ~ 110)	110	110(110 ~ 114.3)	114.3(114.3 ~ 200)	200
D7	20	31.5	50	63	80	125	140
D8	67	79	109	135	168	233	280
D9	Ø3	Ø5x深度(D)8	Ø6x深度(D)7	Ø6x深度(D)7	Ø8x深度(D)7	Ø10x深度(D)10	Ø12x深度(D)10
D10	4-M3	7-M5x深度(D)8	8-M6x深度(D)12	11-M6x深度(D)12	11-M8x深度(D)17	11-M10x深度(D)20	12-M16x深度(D)25
D11	8-Ø3.4	8-Ø4.5	8-Ø5.5	8-Ø5.5	12-Ø6.6	12-Ø9	16-Ø13.5
D12	46	45(45 ~ 70)	70(70 ~ 145)	145	145(145 ~ 200)	200(200 ~ 235)	235
D13	M4	M4 ~ M5	M5 ~ M8	M8	M8 ~ M12	M12	M12
L1	3	3	6	6	6	8	12
L2	7	7	10	10	14.5	15	21.5
L3	4	4	7	8	10	12	18
L4	19.5	19.5	30	29	38	50	66
L5	4	8	12	13	12	16	20
L6	3.5	4 ~ 5	5 ~ 10	10	6 ~ 8	6 ~ 10	10
L7	30	28(28 ~ 34)	32(32 ~ 59)	60	73(73 ~ 115)	88(88 ~ 117)	119.5
L8	70	80.5 ~ 87	97(97 ~ 120)	142	159(159 ~ 201)	196(196 ~ 229)	255
C1	48	60(40 ~ 60)	90(60 ~ 130)	130	130(130 ~ 180)	180(180 ~ 220)	220

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL：VRT

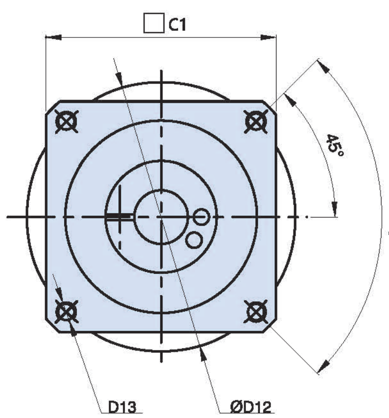
2–Stage

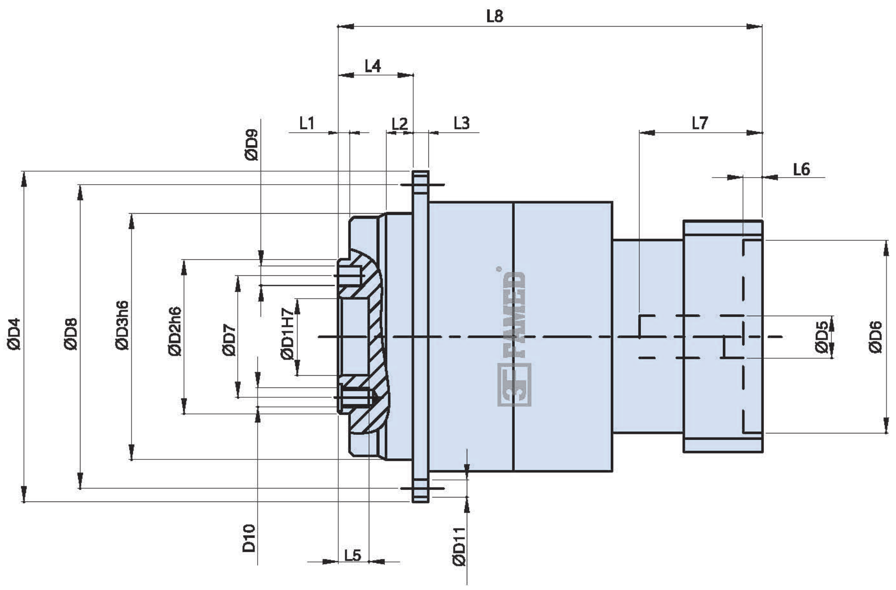
Ratio：12，15，16，20，25，28，30，35
40，50，70，80，100



Dimensions：

Input





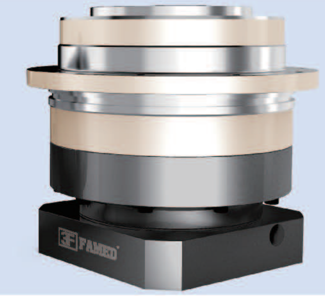
Unit:mm

Size	VRT047–L2	VRT064–L2	VRT090–L2	VRT110–L2	VRT140–L2	VRT200–L2	VRT255–L2
D1	12	20	31.5	40	50	80	100
D2	28	40	63	80	100	160	180
D3	47	64	90	110	140	200	255
D4	72	86	118	145	179	247	300
D5	≤11/≤12	11(8 ~ 14)	19(14 ~ 22)	19(22 ~ 28)	19(19 ~ 38)	35(24 ~ 48)	38(38 ~ 55)
D6	30	30(30 ~ 50)	50(50 ~ 110)	70(70 ~ 110)	70(70 ~ 114.3)	110(110 ~ 200)	114.3(114.3 ~ 200)
D7	20	31.5	50	63	80	125	140
D8	67	79	109	135	168	233	280
D9	Ø3	Ø5x深度(D)8	Ø6x深度(D)7	Ø6x深度(D)7	Ø8x深度(D)7	Ø10x深度(D)10	Ø12x深度(D)10
D10	4–M3	7–M5x深度(D)8	8–M6x深度(D)12	11–M6x深度(D)12	11–M8x深度(D)17	11–M10x深度(D)20	12–M16x深度(D)25
D11	8–Ø3.4	8–Ø4.5	8–Ø5.5	8–Ø5.5	12–Ø6.6	12–Ø9	16–Ø13.5
D12	46	45(45 ~ 70)	70(70 ~ 145)	90(90 ~ 145)	90(90 ~ 200)	145(145 ~ 235)	200(200 ~ 235)
D13	M4	M4 ~ M5	M5 ~ M8	M6 ~ M8	M5 ~ M12	M8 ~ M12	M12
L1	3	3	6	6	6	8	12
L2	7	7	10	10	14.5	15	20
L3	4	4	7	8	10	12	18
L4	19.5	19.5	30	29	38	50	66
L5	4	8	12	13	12	16	20
L6	3.5	4 ~ 5	5 ~ 10	6 ~ 10	6 ~ 8	6 ~ 10	6 ~ 10
L7	30	28(28 ~ 34)	34(34 ~ 59)	43(43 ~ 60)	65(65 ~ 85)	73(73 ~ 117)	73(73 ~ 117)
L8	97.5	103(103 ~ 110)	123(123 ~ 139)	150(150 ~ 176)	195(195 ~ 211)	292(292 ~ 336)	306(306 ~ 322)
C1	48	60(40 ~ 60)	90(60 ~ 130)	90(90 ~ 130)	90(90 ~ 180)	180(130 ~ 220)	180(180 ~ 220)

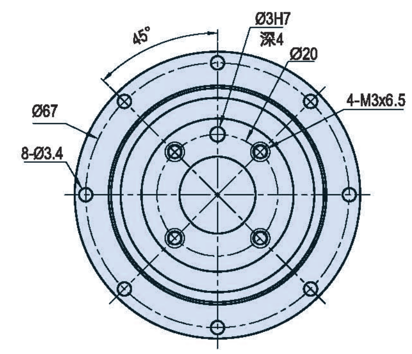
Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL：VRT

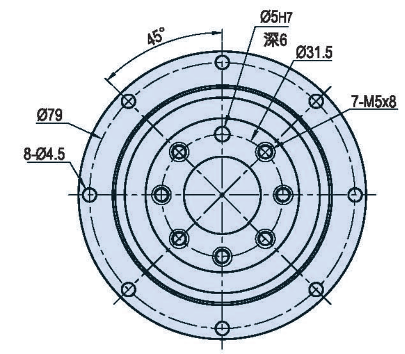
Output Dimensions：



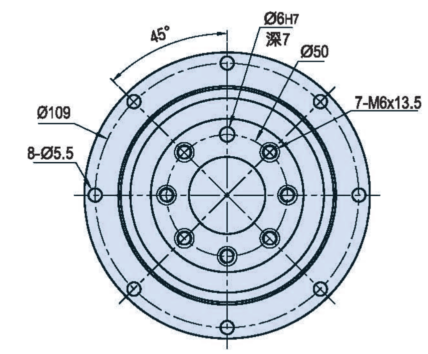
VRT047 OUTPUT



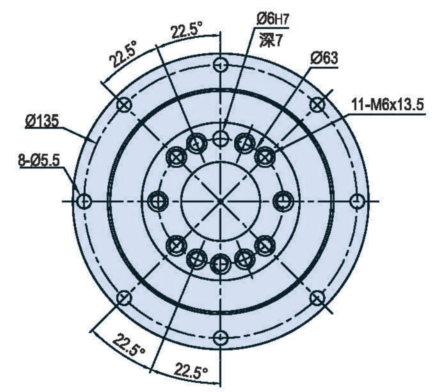
VRT064 OUTPUT



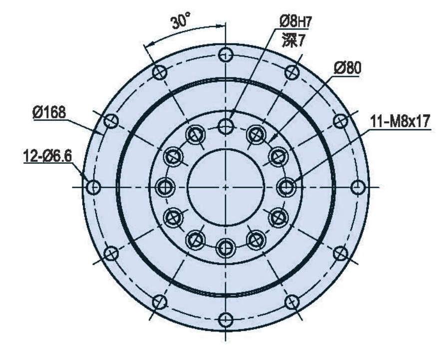
VRT090 OUTPUT



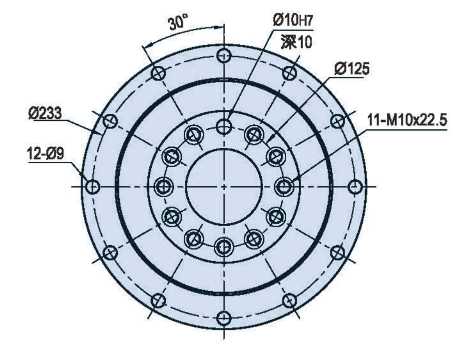
VRT110 OUTPUT



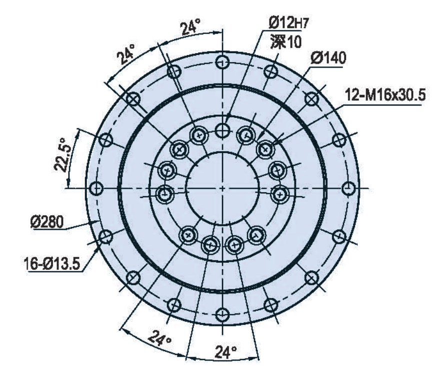
VRT140 OUTPUT



VRT200 OUTPUT



VRT255 OUTPUT



High Precision Flange Output Right Angle Planetary Gearbox

EVT

- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 3.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

EVT Type

EVT090 – 10 – S1 – P1 / Motor

Reducer Model
EVT047, EVT064, EVT090
EVT110, EVT140, EVT200
EVT255

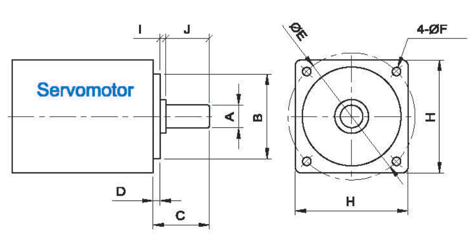
Output flange mode
S1: Standard flange face output
S2: Non standard flange face output

Motor Model
Motor Manufacturer & Model

Ratio
1-stage: 3, 4, 5, 6, 7, 8, 9, 10
2-stage: 12, 15, 16, 20, 25, 28, 30, 35, 40, 50, 70, 80, 100

Backlash Grade
P0: High precision backlash
P1: Precision backlash
P2: Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions:



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

EVT Reducer Specifications

Specs	Unit	Stage	Ratio	EVT047	EVT064	EVT090	EVT110	EVT140	EVT200	EVT255
Rated Output Torque / T2N	Nm	1	4	19	50	140	290	542	1050	1700
			5	22	60	160	330	650	1200	2000
			7	19	50	140	300	550	1100	1800
			10	14	60	160	330	650	1200	2000
		2	20	20	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			35	22	60	160	330	650	1200	2000
			40	22	50	140	290	542	1050	1700
			50	22	60	160	330	650	1200	2000
			70	22	60	160	330	600	1200	2000
			100	22	60	160	330	650	1200	2000
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	4~100	3Times of Nominal Output Torque						
Rated Input Speed / n_{1N}	rpm	1,2	4~100	5000	5000	4000	4000	3000	3000	2000
Max.Input Speed / n_{1B}	rpm	1,2	4~100	10000	10000	8000	8000	6000	6000	4000
Micro Backlash P0	arcmin	1	4~10	≤2	≤2	≤2	≤2	≤2	≤2	≤2
		2	12~100	≤4	≤4	≤4	≤4	≤4	≤4	≤4
Precision Backlash P1	arcmin	1	4~10	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	20~100	≤6	≤6	≤6	≤6	≤6	≤6	≤6
Standard Backlash P2	arcmin	1	4~10	≤6	≤6	≤6	≤6	≤6	≤6	≤6
		2	20~100	≤8	≤8	≤8	≤8	≤8	≤8	≤8
Torsional Rigidity	Nm/arcmin	1,2	4~100	8	13	30	80	150	450	1010
Max.Radial Force / F_{2rB}[2]	N	1,2	4~100	43	125	235	430	1300	3064	5900
Max.Axial Force / F_{2a1B}[2]	N	1,2	4~100	990	1050	2850	2990	10590	16660	29430
Service Life	hr	1,2	4~100	22000h						
Efficiency / η	%	1	4~10	≥97%						
		2	20~100	≥94%						
Weight	kg	1	4~10	0.7	1.3	3.2	5.8	12.3	33	57.9
		2	20~100	1	1.5	4.1	7.6	16.8	38	72.6
Operating Temperature	℃	1,2	4~100	(-15℃ ~ +90℃)						
Lubrication		1,2	4~100	(Synthetic Grease)						
Protection Class		1,2	4~100	IP65						
Mounting Position		1,2	4~100	(Any Direction)						
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	4~100	≤58	≤59	≤62	≤65	≤68	≤69	≤70

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	EVT047	EVT064	EVT090	EVT110	EVT140	EVT200	EVT255
Moment of Inertia	$kg.cm^2$	1	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
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
		2	20–40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			50–100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

1. Ratio (i=Nin/Nout) . 2. 2.The Max. acceleration torque T2B=60% of T2NOT.
3. When output speed is 100rpm, acting on the output shaft center position *Continuous operation, service life is 15000hrs.

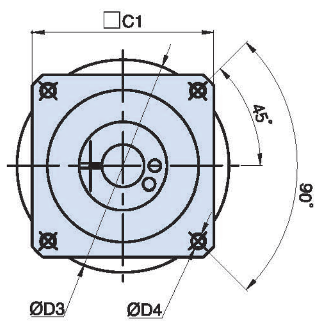
MODEL：EVT

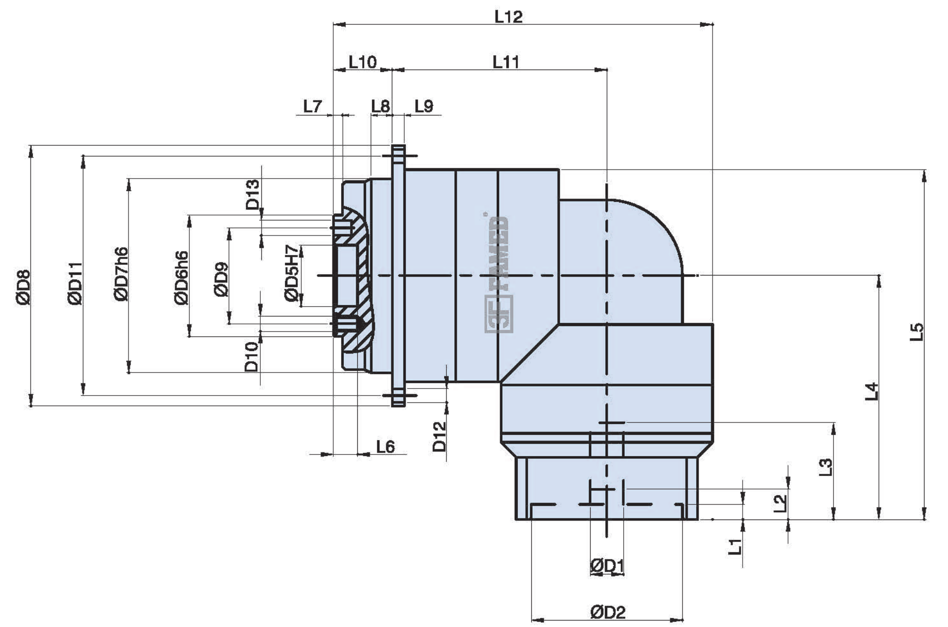
1–Stage

Ratio：3，4，5，6，7，8，9，10

Dimensions：

Input





Unit:mm

Size	EVT047–L1	EVT064–L1	EVT090–L1	EVT110–L1	EVT140–L1	EVT200–L1	EVT255–L1
D1	≤11/≤12	11(11～14)	19(19～24)	24(22～32)	32(24～35)	≤48	≤55
D2	30	50	70(70～110)	110(110～130)	110(110～114.3)	85	116
D3	46	70	90(90～145)	145(145～165)	145(145～200)	215	235
D4	M4	M4	M8	M8～M10	M8～M12	M12	M12
D5	12	20	31.5	40	50	80	100
D6	28	40	63	80	100	160	180
D7	47	64	90	110	140	200	255
D8	72	86	118	145	179	247	300
D9	20	31.5	50	63	80	125	140
D10	4–M3	7–M5x深度(D)8	8–M6x深度(D)12	11–M6x深度(D)12	11–M8x深度(D)17	11–M10x深度(D)20	12–M16x深度(D)25
D11	67	79	109	135	168	233	280
D12	8–Ø3.4	8–Ø4.5	8–Ø5.5	8–Ø5.5	12–Ø6.6	12–Ø9	16–Ø13.5
D13	Ø3	Ø5x深度(D)8	Ø6x深度(D)7	Ø6x深度(D)7	Ø8x深度(D)7	Ø10x深度(D)10	Ø12x深度(D)10
L1	3.5	5	12	10	8	6	6
L2	8	10	13	19	17	20	24
L3	30	32	42～47	57～60	67～77	85	116
L4	74	80.5	107～112	134～147.5	166.5～167	213.5	268.5
L5	104	115.5	152～157	195～208.5	217.5～241.5	316	398.5
L6	6.5	8	12	13	12	22.5	30.5
L7	3	3	6	6	6	8	12
L8	7	7	10	11	15	15	20
L9	4	4	7	8	10	12	18
L10	19.5	19.5	25	29	38	50	66
L11	60	71	102	130	142.5	189	216
L12	107.5	125.5	172	220	255.5	334.5	392
C1	48	60	90(90～130)	130～160	130(130～220)	190	220

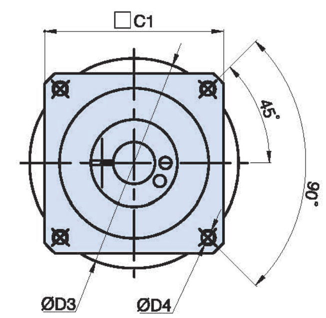
MODEL：EVT

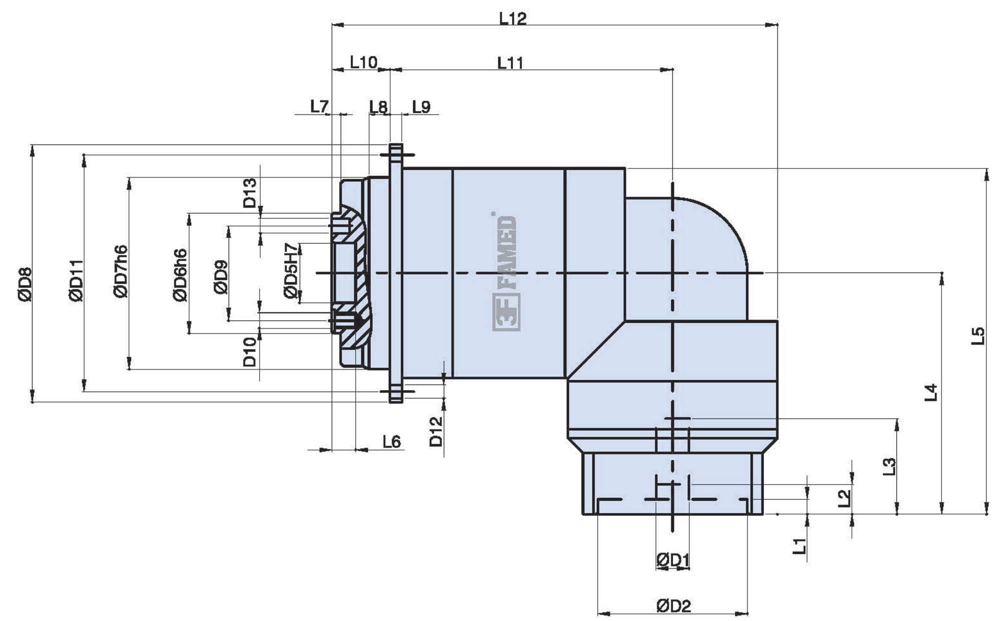
2–Stage

Ratio：12，15，16，20，25，28，30，35
40，50，70，80，100

Dimensions：

Input





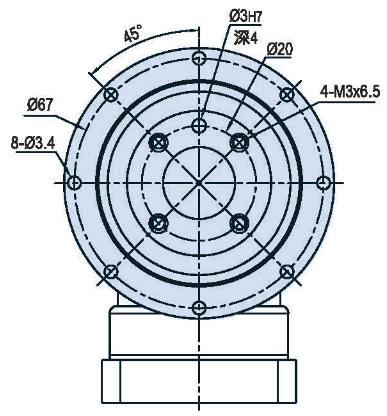
Unit:mm

Size	EVT47–L2	EVT064–L2	EVT090–L2	EVT110–L2	EVT140–L2	EVT200–L2	EVT255–L2
D1	≤11/≤12	11(11～14)	19(19～24)	24(22～32)	32(24～35)	≤48	≤55
D2	30	50	70(70～110)	110(110～130)	110(110～114.3)	85	116
D3	46	70	90(90～145)	145(145～165)	145(145～200)	215	235
D4	M4	M4	M8	M8～M10	M8～M12	M12	M12
D5	12	20	31.5	40	50	80	100
D6	28	40	63	80	100	160	180
D7	47	64	90	110	140	200	255
D8	72	86	118	145	179	247	300
D9	20	31.5	50	63	80	125	140
D10	4–M3	7–M5x深度(D)8	8–M6x深度(D)12	11–M6x深度(D)12	11–M8x深度(D)17	11–M10x深度(D)20	12–M16x深度(D)25
D11	67	79	109	135	168	233	280
D12	8–Ø3.4	8–Ø4.5	8–Ø5.5	8–Ø5.5	12–Ø6.6	12–Ø9	16–Ø13.5
D13	Ø3	Ø5x深度(D)8	Ø6x深度(D)7	Ø6x深度(D)7	Ø8x深度(D)7	Ø10x深度(D)10	Ø12x深度(D)10
L1	3.5	5	12	10	8	6	6
L2	8	10	13	19	17	20	24
L3	30	32	42～47	57～60	67～77	85	116
L4	74	80.5	107～112	134～147.5	166.5～167	213.5	268.5
L5	103	115.5	152～157	195～208.5	217.5～241.5	269.5	340
L6	4	8	12	13	12	22.5	30.5
L7	3	3	6	6	6	8	12
L8	7	7	10	11	15	15	20
L9	4	4	7	8	10	12	18
L10	19.5	19.5	30	29	38	50	66
L11	79	94.5	117	163.5	187	243	270
L12	122	149	187	253.5	300	382	403
C1	48	60	90(90～130)	130～160	130(130～220)	190	220

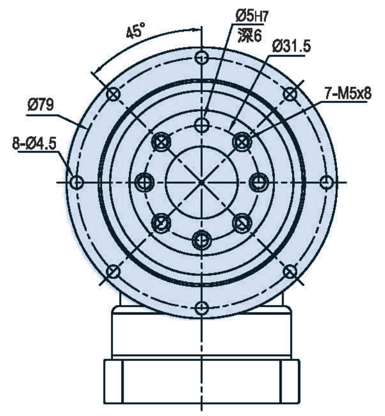
MODEL：EVT

Output Dimensions

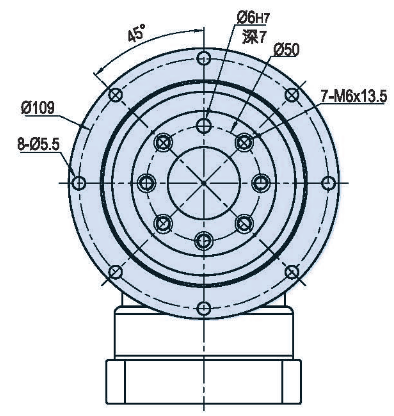
EVT047
OUTPUT



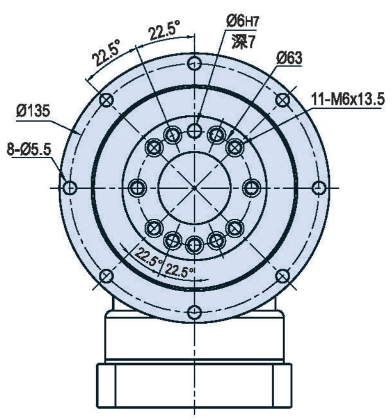
EVT064
OUTPUT



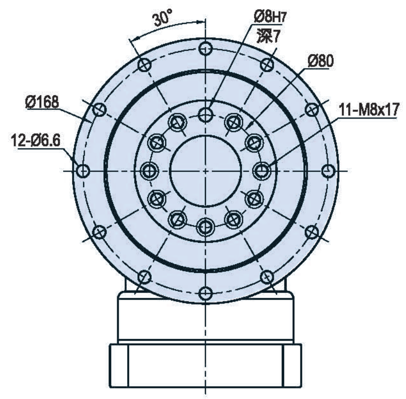
EVT090
OUTPUT



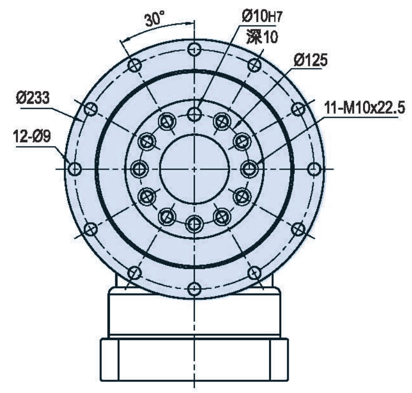
EVT110
OUTPUT



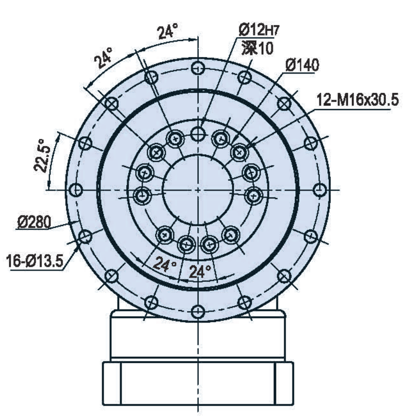
EVT140
OUTPUT



EVT200
OUTPUT



EVT255
OUTPUT



European High Precision High Torque Planetary Gearbox

VRS

- 1.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 2.High rigidity & torque
  The use of integral ball bearings greatly improves the rigidity and torque.
- 3.High load capacity
  The main output shaft adopts taper roller bearing to greater increase the radial and axial force.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5. No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

VRS Type

VRS090 – 10 – S1 – P1 / Motor

Reducer Model
VRS060，VRS075，VRS100，VRS140
VRS180，VRS210，VRS240

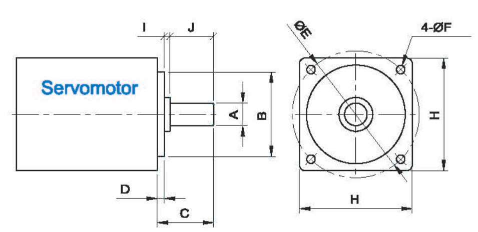
Output Shaft Keyway
S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3，4，5，6，7，8，9，10
2–stage：12，15，16，20，25，28，30，35，40，50，70，80，100

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

VRS Reducer Specifications

Specs	Unit	Stage	Ratio	VRS060	VRS075	VRS100	VRS140	VRS180	VRS210	VRS240
Rated Output Torque / T2N	Nm	1	3	55	130	208	342	588	1140	1500
			4	50	140	290	542	1050	1700	2500
			5	60	160	330	650	1200	2000	2500
			6	55	150	310	600	1100	1900	2260
			7	50	140	300	550	1100	1800	2300
			8	45	120	260	500	1000	1600	2100
			9	40	100	230	450	900	1500	1800
			10	40	100	230	450	900	1500	1800
		2	15	55	130	208	342	588	1140	2300
			16	60	160	330	650	1200	2000	2500
			20	60	160	330	650	1200	2000	2500
			25	55	130	208	342	588	1140	2500
			28	60	160	330	650	1200	2000	2500
			30	50	140	298	542	1050	1700	2300
			35	40	100	230	450	900	1500	2200
			40	60	160	330	650	1200	2000	2350
			50	55	150	310	600	1100	1900	2200
			70	50	140	300	550	1100	1800	2200
			100	40	100	230	450	900	1500	1800
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque						
Rated Input Speed / n_{1N}	rpm	1,2	3~100	5000	4000	4000	3000	3000	2000	1000
Max.Input Speed / n_{1B}	rpm	1,2	3~100	10000	8000	8000	6000	6000	4000	2500
Micro Backlash P0	arcmin	1	3~10	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	12~100	≤3	≤3	≤3	≤3	≤3	≤3	≤3
Precision Backlash P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	15~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Torsional Rigidity	Nm/arcmin	1,2	3~100	7	14	25	50	145	225	260
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	2750	4100	6400	9880	15000	20000	27500
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	2350	3200	5360	9690	14200	28000	30000
Service Life	hr	1,2	3~100	20000h						
Efficiency / η	%	1	3~10	≥96%						
		2	15~100	≥93%						
Weight	kg	1	3~10	1.8	3.8	7.2	16.8	32	49	65
		2	15~100	2.1	4.1	8.1	17.5	35	53	70
Operating Temperature	℃	1,2	3~100	(−15℃ ~ +90℃)						
Lubrication		1,2	3~100	(Synthetic Grease)						
Protection Class		1,2	3~100	IP65						
Mounting Position		1,2	3~100	(Any Direction)						
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤62	≤65	≤68	≤68	≤70	≤70

Reducer Rotary Inertia

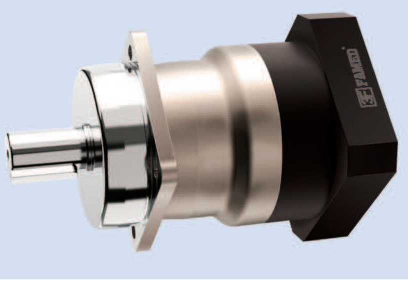
Specs	Unit	Stage	Ratio	VRS060	VRS075	VRS100	VRS140	VRS180	VRS210	VRS240
Moment of Inertia	$kg.cm^2$	1	3	0.16	0.61	3.25	9.21	28.98	69.61	82.16
			4	0.14	0.48	2.74	7.54	23.67	54.37	75.58
			5	0.13	0.47	2.71	7.42	23.29	53.27	75.29
			6	0.13	0.45	2.65	7.25	22.75	51.72	72.35
			7	0.13	0.45	2.62	7.14	22.48	50.97	69.13
			8	0.13	0.44	2.58	7.07	22.59	50.84	69.22
			9	0.13	0.44	2.57	7.04	22.53	50.63	66.23
			10	0.13	0.44	2.57	7.03	22.51	50.56	66.23
		2	15–40	0.03	0.13	0.47	2.71	7.42	23.29	48.23
			50–100	0.03	0.13	0.44	2.57	7.03	22.51	45.58

1. Ratio (i=Nin/Nout) 2. When output speed is 100rpm, acting on the output shaft center position
3. *Continuous operation, service life is 10000hrs

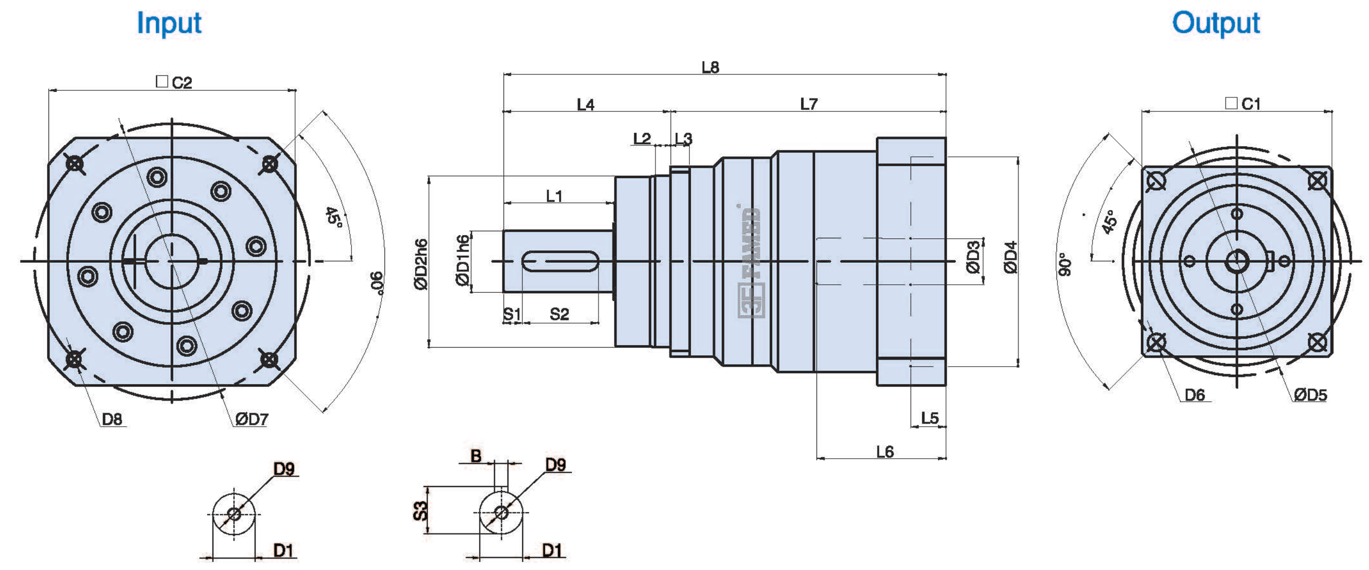
MODEL: VRS

1–Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10



Dimensions:



Output shaft type S1   Output shaft type S2

Unit:mm

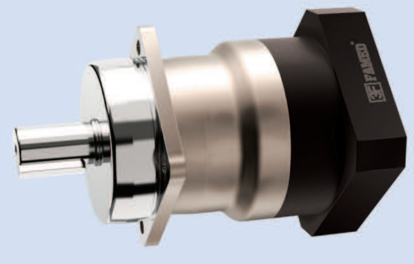
Size	VRS060–L1	VRS075–L1	VRS100–L1	VRS140–L1	VRS180–L1	VRS210–L1	VRS240–L1
D1	16	22	32	40	55	75	85
D2	60	70	90	130	160	180	200
D3	8(8 ~ 19)	14(14 ~ 24)	19(19 ~ 35)	24(24 ~ 48)	38(38 ~ 48)	48(48 ~ 55)	60
D4	30(30 ~ 70)	50(50 ~ 110)	70(70 ~ 114.3)	110(110 ~ 114.3)	114.3(114.3 ~ 200)	200	220
D5	68	85	120	165	215	250	290
D6	4–Ø5.5	4–Ø6.6	4–Ø9	4–Ø11	4–Ø13.5	4–Ø17	4–Ø17
D7	46(45 ~ 90)	70(70 ~ 145)	90(90 ~ 200)	145(145 ~ 200)	200(200 ~ 235)	235	240
D8	M3 ~ M5	M4 ~ M8	M5 ~ M12	M8 ~ M12	M12	M12	M16
D9	M5	M8	M12	M16	M20	M20	M20
L1	28	36	58	82	82	105	130
L2	5	6	8	10	12	15	20
L3	6	7	10	12	15	17	20
L4	48	56	88	112	112	143	170
L5	7.5 ~ 9	10.5 ~ 16	12 ~ 36.5	8	10	10	12
L6	42 ~ 43.5	50.5 ~ 66	62 ~ 82	69 ~ 115	83 ~ 117	116	55
L7	94.5 ~ 96	117.5 ~ 133	139 ~ 153	170 ~ 216	210 ~ 244	257	295
L8	142.5 ~ 144	173.5 ~ 189	227 ~ 247	282 ~ 328	322 ~ 356	400	465
C1	60	75	100	140	182	215	240
C2	40(40 ~ 80)	60(60 ~ 130)	80(80 ~ 180)	130(130 ~ 180)	180(180 ~ 220)	220	250
S1	2	3	10	5	6	7	3
S2	22	28	40	70	70	90	105
S3	18	24.5	35	43	59	79.5	90
B	5	6	10	12	16	20	22

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL：VRS

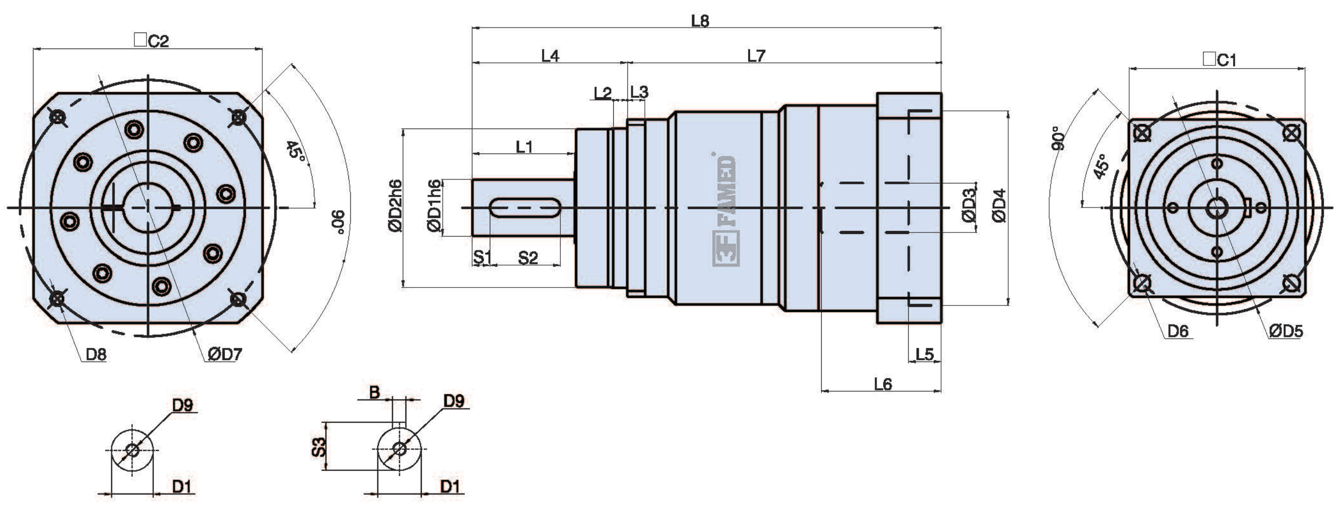
2–Stage

Ratio：15，16，20，25，28，30，35，40，
50，70，100



Dimensions：

Input Output



Output shaft type S1 Output shaft type S2

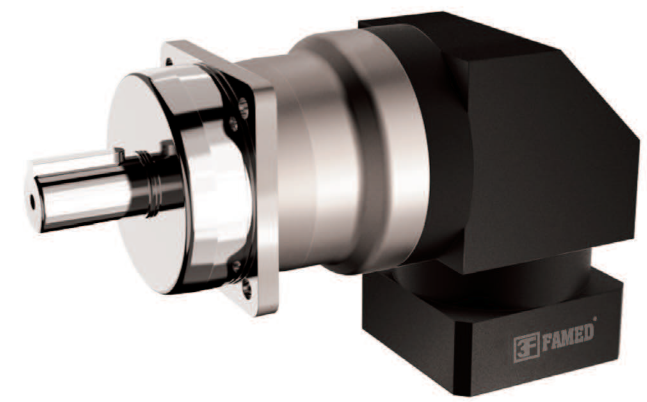
Unit:mm

Size	VRS060–L2	VRS075–L2	VRS100–L2	VRS140–L2	VRS180–L2	VRS210–L2	VRS240–L2
D1	16	22	32	40	55	75	85
D2	60	70	90	130	160	180	200
D3	8(8～14)	14(14～24)	19(19～28)	24(24～38)	38(24～42)	48(48～55)	48
D4	30(30～50)	50(50～110)	50(50～110)	110(110～114.3)	114.3(110～114.3)	200	220
D5	68	85	120	165	215	250	290
D6	4–Ø5.5	4–Ø6.6	4–Ø9	4–Ø11	4–Ø13.5	4–Ø17	4–Ø17
D7	46(45～70)	70(70～145)	70(70～145)	145(145～200)	200(145～200)	235	240
D8	M3～M5	M4～M8	M5～M8	M8～M12	M8～M12	M12	M16
D9	M5	M8	M12	M16	M20	M20	M20
L1	28	36	58	82	82	105	130
L2	5	6	8	10	12	15	20
L3	6	7	10	12	15	17	20
L4	48	56	88	112	112	143	170
L5	8～9	10.5～16	12～18.5	6～8	6～10	10	12
L6	42.5～43.5	50.5～66	61～68	69～81	69～117	116	55
L7	116.5～117.5	143～158.5	172～178	210～222	236.5～293.5	257	346
L8	164.5～165.5	199～214.5	260～266	322～334	348.5～406.5	400	516
C1	60	75	100	140	182	215	240
C2	40(40～65)	60(60～130)	60(60～130)	130(130～180)	130(130～180)	220	250
S1	2	3	10	5	6	7	3
S2	22	28	40	70	70	90	105
S3	18	24.5	35	43	59	79.5	90
B	5	6	10	12	16	20	22

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

European High Precsion High Torque Right Angle Planetary Gearbox

EVS



- 1.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 2.High rigidity & torque
  The use of integral ball bearings greatly improves the rigidity and torque.
- 3.High load capacity
  The main output shaft adopts taper roller bearing to greater increase the radial and axial force.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5. No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

EVS Type

EVS090 – 10 – S1 – P1 / Motor

Reducer Model
EVS062，EVS075，EVS100
EVS142，EVS180

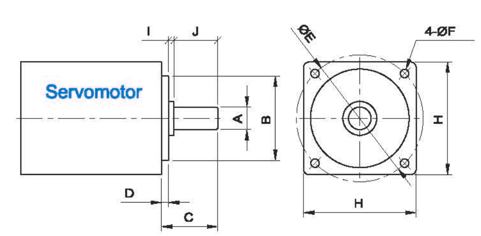
Output Shaft Keyway
S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3, 4, 5, 6, 7, 8, 9, 10,12, 14,16, 18, 20
2–stage：15, 20, 25, 30, 35,40, 50, 60,70, 80
90, 100, 120, 140,160, 180, 200

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type — Model — Ratio — Output Shaft Keyway — Backlash Class — MOTOR NO.

EVS Reducer Specifications

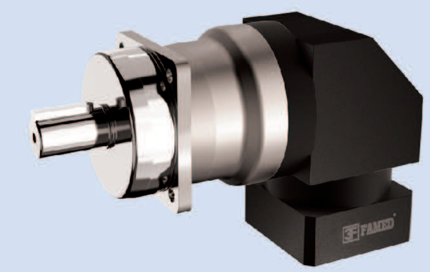
Specs	Unit	Stage	Ratio	EVS062	EVS075	EVS100	EVS142	EVS180
Rated Output Torque / T2N	Nm	1	3	55	130	208	342	588
			4	50	140	290	542	1050
			5	60	160	330	650	1200
			6	55	150	310	600	1100
			7	50	140	300	550	1100
			8	50	140	290	542	1050
			9	40	100	230	450	900
			10	60	160	330	650	1200
			14	50	140	300	550	1100
			20	40	100	230	450	900
		2	15	55	130	208	342	588
			20	50	140	290	542	1050
			25	60	160	330	650	1200
			30	55	130	208	342	588
			35	60	160	330	650	1200
			40	50	140	290	542	1050
			50	60	160	330	650	1200
			70	60	160	330	600	1200
			80	50	140	290	542	1050
			100	60	160	330	650	1200
			120	—	150	310	600	1100
			140	—	140	300	550	1100
			160	—	120	260	500	1000
			180	—	98	225	445	895
			200	—	100	230	450	900
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~200	3Times of Nominal Output Torque				
Rated Input Speed / n_{1N}	rpm	1,2	3~200	3000	3000	3000	2500	2000
Max.Input Speed / n_{1B}	rpm	1,2	3~200	6000	6000	5500	4500	4500
Precision Backlash P0	arcmin	1	3~20	≤2	≤2	≤2	≤2	≤2
		2	15~200	≤4	≤4	≤4	≤4	≤4
Precision Backlash P1	arcmin	1	3~20	≤4	≤4	≤4	≤4	≤4
		2	15~200	≤6	≤6	≤6	≤6	≤6
Standard Backlash P2	arcmin	1	3~20	≤6	≤6	≤6	≤6	≤6
		2	15~200	≤8	≤8	≤8	≤8	≤8
Torsional Rigidity	Nm/arcmin	1,2	3~200	6	14	25	56	140
Max.Radial Force / F_{2rB}[2]	N	1,2	3~200	1300	3200	6750	9400	14500
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~200	700	1580	3300	4700	7200
Service Life	hr	1,2	3~200	21000 h				
Efficiency / η	%	1	3~20	≥93%				
		2	25~200	≥90%				
Weight	kg	1	3~20	1.5	6.4	13	24.5	51
		2	25~200	2.1	7.8	14.2	27.5	54
Operating Temperature	℃	1,2	3~200	(-15℃ ~ +90℃)				
Lubrication		1,2	3~200	(Synthetic Grease)				
Protection Class		1,2	3~200	IP65				
Mounting Position		1,2	3~200	(Any Direction)				
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~200	≤65	≤68	≤68	≤70	≤72

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	EVS062	EVS075	EVS100	EVS142	EVS180
Moment of Inertia	$kg.cm^2$	1	3~10	0.35	2.25	6.84	23.4	68.9
			14~20	0.07	1.87	6.25	21.8	65.6
		2	15~100	0.09	0.35	2.25	6.84	23.4
			120~200	—	0.31	1.87	6.25	21.8

1. The Max. acceleration torque T2B=60% of T2NOT 2. When output speed is 100rpm, inertia acts on the output shaft center position.
3. 3-stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

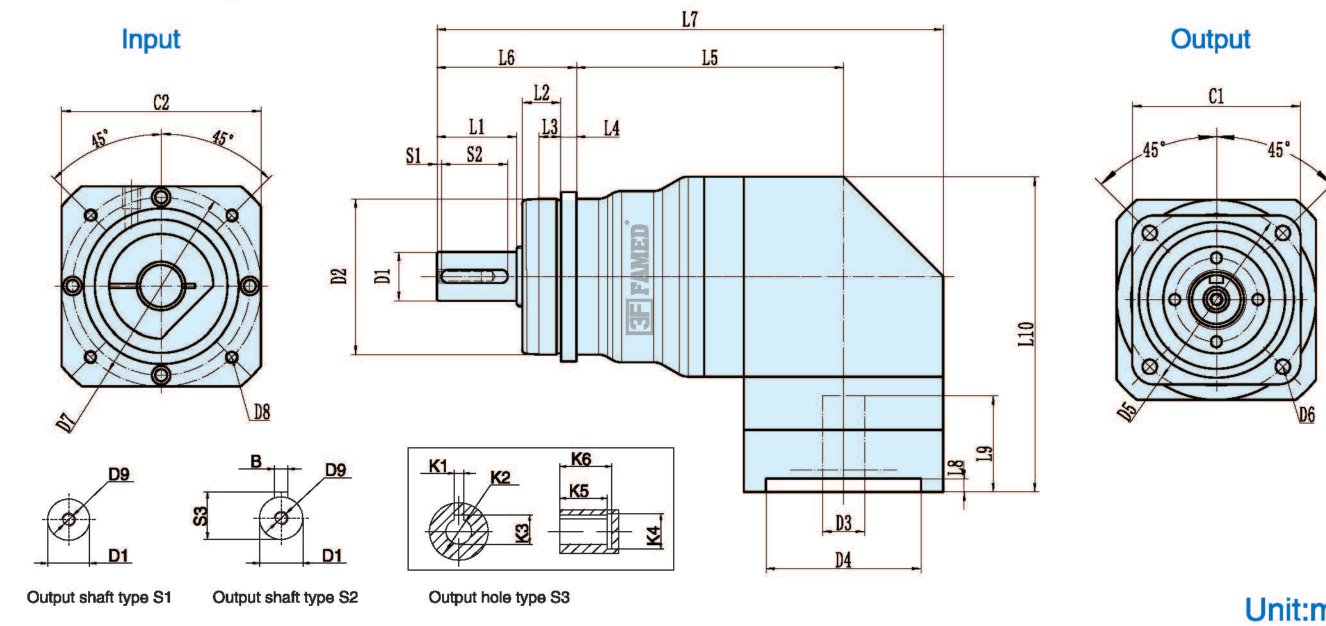
MODEL: EVS



1-Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10, 12, 14,16, 18, 20

Dimensions:



Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

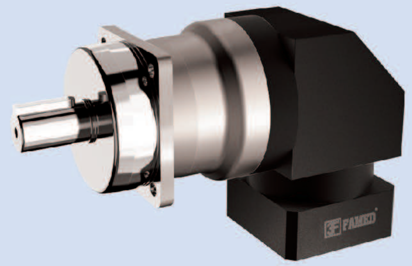
Size	EVS062-L1	EVS075-L1	EVS100-L1	EVS142-L1	EVS180-L1
D1	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55
D2	ϕ50	ϕ70	ϕ90	ϕ130	ϕ160
D3	ϕ14 (≤19)	ϕ19 (≤24)	ϕ24 (≤35)	ϕ24 (≤42)	ϕ35 (≤42)
D4	ϕ50 (≤70)	ϕ70 (≤110)	ϕ110 (≤114.3)	ϕ110 (≤114.3)	ϕ114.3 (≤180)
D5	ϕ70	ϕ85	ϕ120	ϕ165	ϕ215
D6	4-ϕ5.5	4-ϕ6.6	4-ϕ9	4-ϕ11	4-ϕ13
D7	ϕ70 (≤130)	ϕ90 (≤145)	ϕ145 (≤200)	ϕ145 (≤200)	ϕ200 (≤300)
D8	(4-M4*10L)	(4-M5*12.5L)	(4-M8*20L)	(4-M8*16L)	(4-M12*30L)
D9	M5*12L	M6*15L	M12*25L	M16*36L	M20*42L
L1	28.5	36	56	82	82
L2	18	17.5	27	28	27
L3	10	10	15	10	15
L4	6	7	10	12	15
L5	87	120.5	143.5	163.5	117.5
L6	48	56	88	112	112
L7	171	228.5	299	347.5	394.5
L8	(4)	(6)	(14)	(19)	(10)
L9	(32.5)	(43.5)	(67.5)	(64.5)	(118)
L10	(98)	(142)	(185)	(220)	(276.5)
C1	□62	□76	□100	□140	□180
C2	(□60)	(□90)	(□130)	(□130)	(□180)
S1		2	5	5	6
S2	25	30	40	68	70
S3	18	24.5	35.5	43	59
B	5	6	10	12	16
K1	4	6	8	10	14
K2	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50
K3	12.8	24.5	31.3	42	53.8
K4	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60
K5	15	20	27	35	43
K6	18	24	32	40	50

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

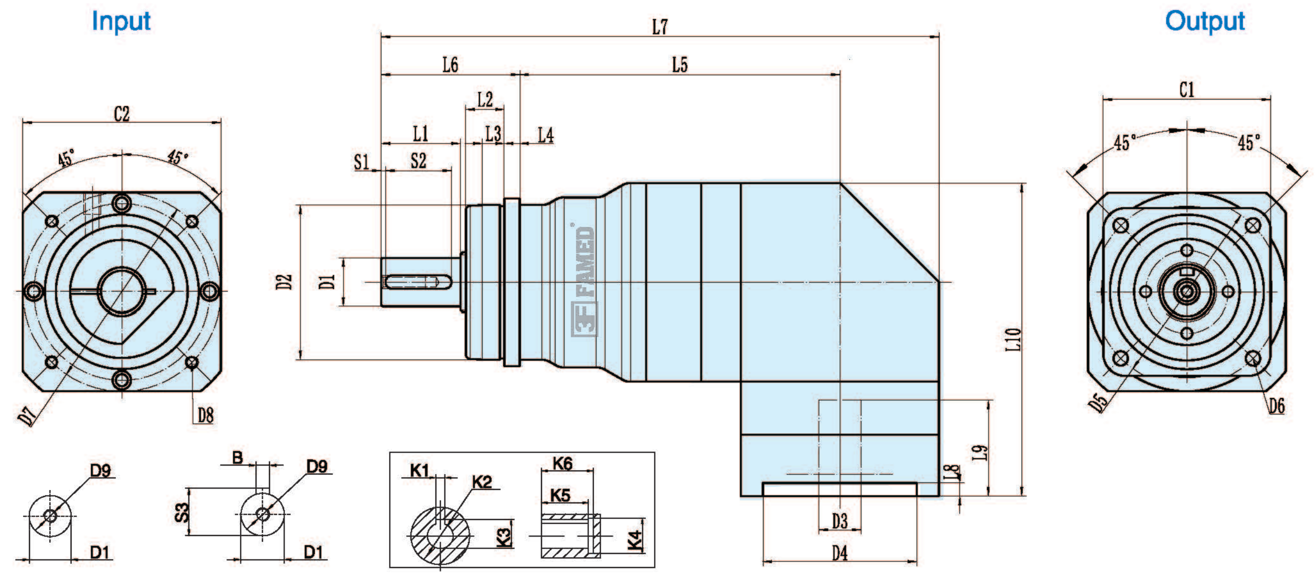
MODEL: EVS

2–Stage

Ratio: 15, 20, 25, 30, 35, 40, 50, 60,70, 80,90
100, 120, 140, 160, 180, 200



Dimensions:



Output shaft type S1 | Output shaft type S2 | Output hole type S3

Unit:mm

Size	EVS062–L2	EVS075–L2	EVS100–L2	EVS142–L2	EVS180–L2
D1	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55
D2	ϕ50	ϕ70	ϕ90	ϕ130	ϕ160
D3	ϕ14 (≤19)	ϕ19 (≤24)	ϕ24 (≤35)	ϕ24 (≤35)	ϕ35 (≤55)
D4	ϕ50 (≤70)	ϕ70 (≤110)	ϕ110 (≤114.3)	ϕ110 (≤114.3)	ϕ114.3 (≤180)
D5	ϕ70	ϕ85	ϕ120	ϕ165	ϕ215
D6	4–ϕ5.5	4–ϕ6.6	4–ϕ9	4–ϕ11	4–ϕ13
D7	ϕ70 (≤130)	ϕ90 (≤145)	ϕ145 (≤200)	ϕ145 (≤200)	ϕ200 (≤300)
D8	(4–M4*10L)	(4–M5*12.5L)	(4–M8*20L)	(4–M8*16L)	(4–M12*30L)
D9	M5*12L	M6*15L	M12*25L	M16*36L	M20*42L
L1	28.5	36	56	82	82
L2	18	17.5	27	28	27
L3	10	10	15	10	15
L4	6	7	10	12	15
L5	103.5	148.5	174.5	194.5	217.5
L6	48	56	88	112	112
L7	187.5	256.5	330	378.5	434.5
L8	(4)	(6)	(14)	(6)	(10)
L9	(32.5)	(43.5)	(67.5)	(55.5)	(118)
L10	(98)	(142)	(185)	(196)	(276.5)
C1	□62	□76	□100	□140	□180
C2	(□60)	(□90)	(□130)	(□130)	(□180)
S1		2	5	5	6
S2	25	30	40	68	70
S3	18	24.5	35.5	43	59
B	5	6	10	12	16
K1	4	6	8	10	14
K2	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50
K3	12.8	24.5	31.3	42	53.8
K4	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60
K5	15	20	27	35	43
K6	18	24	32	40	50

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

High Precsion High Torque Planetary Gearbox

PAB

- The integral structure of the planetary wall frame and the output shaft ensures the maximum torsion rigidity and stability
- The surface of the gear box is treated with electroless Nickel, and the plate is treated with blue anode to improve the tolerance and corrosion resistance of the environment.
- Lowest backlash
- High efficiency 95%
- Life time lubrication

Model Selection of Speed Reducers

PAB Type

PAB090 – 10 – S1 – P1 / Motor

Reducer Model

PAB042, PAB060, PAB090, PAB115
PAB142, PAB180, PAB220, PAB240
PAB280, PAB300

Output Shaft Keyway

S1: Solid Output Shaft No Keyway
S2: Standard (Keyway)
S3: Output for holes

Motor Model

Motor Manufacturer & Model

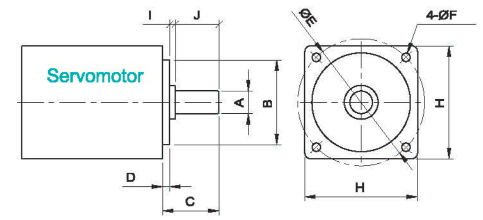
Ratio

1–stage: 3, 4, 5, 6, 7, 8, 9, 10
2–stage: 12, 15, 16, 20, 25, 28, 30, 35,
40, 50, 70, 80, 100

Backlash Grade

P0: High precision backlash
P1: Precision backlash
P2: Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions:



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type — Model — Ratio — Output Shaft Keyway — Backlash Class — MOTOR NO.

PAB Reducer Specifications

Specs	Unit	Stage	Ratio	PAB042	PAB060	PAB090	PAB115	PAB142	PAB180	PAB220	PAB242	PAB285	PAB330
Rated Output Torque / T2N	Nm	1	3	20	45	130	208	342	588	1140	1900	4230	8200
			4	19	50	140	290	542	1050	1700	2420	5620	10190
			5	22	60	160	330	650	1200	2000	2560	5600	7180
			6	20	55	150	310	600	1100	1900	—	—	—
			7	19	50	140	300	550	1100	1800	1830	3520	9800
			8	17	45	120	260	500	1000	1600	1360	2595	4080
			9	14	40	100	230	450	900	1500	—	—	—
			10	14	40	100	230	450	900	1500	1150	1820	5000
		2	15	20	45	130	208	342	588	1140	1900	4230	8200
			16	19	50	140	290	542	1050	1700	3200	4230	10800
			20	22	50	140	290	542	1050	1700	2420	4230	10800
			25	22	60	160	330	650	1200	2000	2650	5620	7550
			28	19	50	140	290	542	1050	1700	1830	3250	7550
			30	22	45	130	208	342	588	1140	1150	4230	7000
			35	22	60	160	330	650	1200	2000	2420	5620	9800
			40	22	50	140	290	542	1050	1700	2420	5620	7550
			50	22	55	160	330	650	1200	2000	2650	5620	7550
			70	19	50	140	290	550	1100	1800	1900	3520	5000
			80	17	45	120	260	500	900	1600	—	—	—
			100	14	40	100	230	450	900	1500	1150	1820	2500
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque									
Rated Input Speed / n_{1N}	rpm	1,2	3~100	4000	4000	4000	3500	3000	2000	2000	1000	1000	1000
Max.Input Speed / n_{1B}	rpm	1,2	3~100	6000	6000	6000	5500	4500	4500	4000	1500	1500	1500
Micro Backlash P0	arcmin	1	3~10	≤1	≤1	≤1	≤1	≤1	≤1	≤1	–	–	–
		2	12~100	≤3	≤3	≤3	≤3	≤3	≤3	≤3	–	–	–
Precision Backlash P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3	–	–	–
		2	12~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5	–	–	–
Standard Backlash P2	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5	≤8	≤8	≤8
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7	≤10	≤10	≤10
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	7	12	25	50	140	210			
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	780	1300	3200	6750	9400	14500	50000	55000	59000	62000
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	330	700	1580	3300	4700	7200	28000	29000	30000	33000
Service Life	hr	1,2	3~100	21000h									
Efficiency / η	%	1	3~10	≥97%									
		2	12~100	≥94%									
Weight	kg	1	3~10	0.5	1.3	3.7	7.8	15	29	52	71	113	245
		2	12~100	0.8	1.48	4.1	9.6	18.9	33	66	75	136	290
Operating Temperature	℃	1,2	3~100	(–15℃ ~ +90℃)									
Lubrication		1,2	3~100	(Synthetic Grease)									
Protection Class		1,2	3~100	IP65									
Mounting Position		1,2	3~100	(Any Direction)									
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤63	≤63	≤63	≤65	≤65	≤70	≤70	≤75	≤75	≤75

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	PAB042	PAB060	PAB090	PAB115	PAB142	PAB180	PAB220	PAB242	PAB285	PAB330
Moment of Inertia	$kg.cm^2$	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61	70.21	73.29	75.23
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37	58.21	70.27	73.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27	59.27	70.61	73.29
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72	53.37	55.72	58.75
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97	51.23	53.97	56.61
			8	0.03	0.13	0.44	2.58	7.07	22.59	50.84	51.72	53.84	56.24
			9	0.03	0.13	0.44	2.57	7.04	22.53	50.63	55.27	58.63	60.54
			10	0.03	0.13	0.44	2.57	7.03	22.51	50.56	55.27	58.56	60.72
		2	12–40	0.03	0.03	0.13	0.47	2.71	7.42	23.29	29.20	31.29	24.29
			50–100	0.03	0.03	0.13	0.44	2.57	7.03	22.51	28.20	30.51	35.51

1. The Max. acceleration torque T2B=60% of T2NOT 2. When output speed is 100rpm, inertia acts on the output shaft center position.

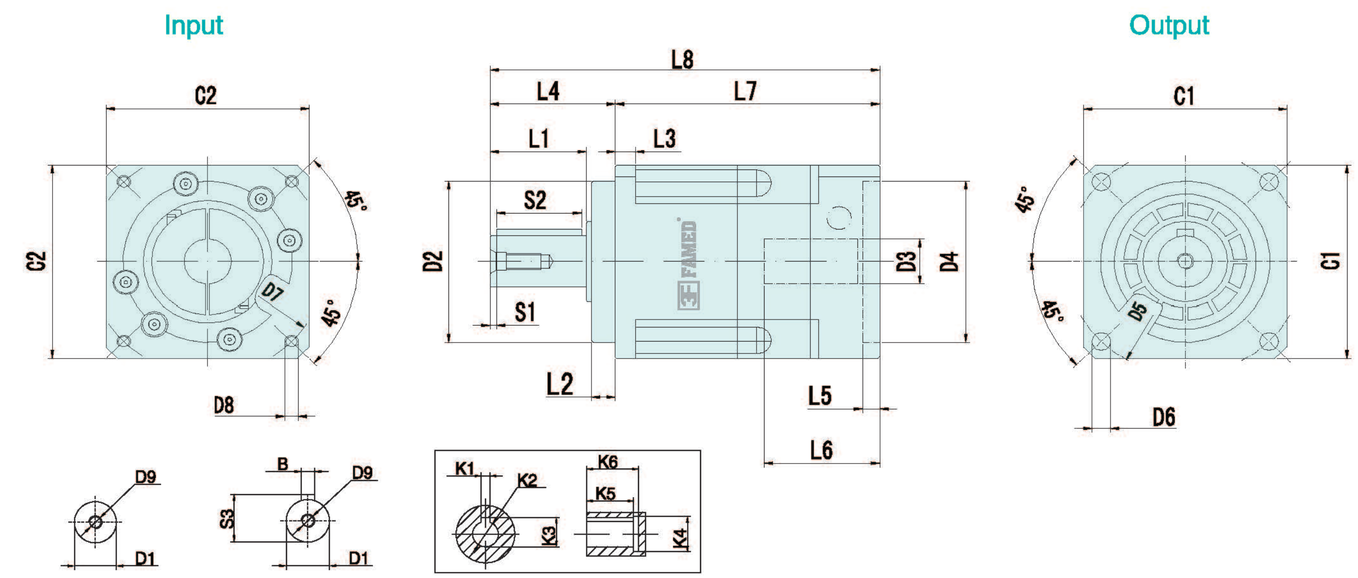
3. 3-stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

MODEL: PAB

1–Stage

Ratio: 3, 4 , 5, 6, 7, 8, 9, 10

Dimensions:



Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

Size	PAB042–L1	PAB060–L1	PAB090–L1	PAB115–L1	PAB142–L1	PAB180–L1	PAB220–L1	PAB242–L1	PAB285–L1	PAB330–L1
D1	ϕ13	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75	ϕ55	ϕ70	ϕ80
D2	ϕ35	ϕ50	ϕ80	ϕ110	ϕ130	ϕ160	ϕ180	ϕ220	ϕ250	ϕ290
D3	ϕ8(≤11)	ϕ14(≤14)	ϕ19(≤24)	ϕ24(≤32)	ϕ35(≤42)	ϕ38(≤50)	ϕ55(≤55)	ϕ42	ϕ55	ϕ60
D4	ϕ30(30–50)	ϕ50(30–70)	ϕ70(50–110)	ϕ110(50–130)	ϕ114.3(95–180)	ϕ180(95–180)	ϕ215(180–255)	ϕ200(114.3–200)	ϕ200	ϕ230
D5	ϕ50	ϕ70	ϕ100	ϕ130	ϕ165	ϕ215	ϕ250	ϕ265	ϕ315	ϕ370
D6	4–ϕ3.4	4–ϕ5.5	4–ϕ6.6	4–ϕ9	4–ϕ11	4–ϕ13	4–ϕ17	4–ϕ18	4–ϕ18	4–ϕ22
D7	ϕ46(22–70)	ϕ70(45–90)	ϕ90(70–145)	ϕ145(70–145)	ϕ200(90–215)	ϕ200(90–300)	ϕ235(200–300)	ϕ200(200–235)	ϕ235	ϕ265
D8	(4–M3X8L)	(4–M5X10L)	(4–M6X12L)	(4–M8X25L)	(4–M12X30L)	(4–M12X30L)	(4–M12X30L)	4–M12	4–M12	4–M12
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2.0P	M20X2.5P	M20X2.5P	M20X40	M16X35	M16X35
L1	19	28.5	36.5	51	79	82	105	105	110	120
L2	5.5	7	10	12	15	20	30	20	20	25
L3	4	6	8	10	12	15	20	22	25	30
L4	26	37	48	65	97	105	138	130	135	150
L5	(4)	(5)	(7)	(11)	(7)	(7)	(12.5)	15	7	10
L6	30	34	45	65	67.5	85	105	118	115	145
L7	(65.5)	(78)	(99)	(135)	(150)	(182)	(226)	262	282	391
L8	(91.5)	(115)	(147)	(200)	(247)	(287)	(365)	392(≤392)	417	541
C1	□42	□60	□90	□115	□142	□180	□220	□242	□285	□330
C2	(□42)	(□60)	(□90)	(□130)	(□142)	(□180)	(□220)	220	285	150
S1	2	2	3	5	5	5	7	5	5	5
S2	16	25	32	40	65	70	90	90	100	110
S3	15	18	24.5	35	43	59	79	74.5	74.5	85
B	5	5	6	10	12	16	20	20	20	22
K1	–	4	6	8	10	14	16	–	–	–
K2	–	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50	ϕ60	–	–	–
K3	–	12.7	25	31.3	42	53.8	64.4	–	–	–
K4	–	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60	ϕ72	–	–	–
K5	–	15	20	27	35	43	60	–	–	–
K6	–	18	24	32	40	50	65	–	–	–

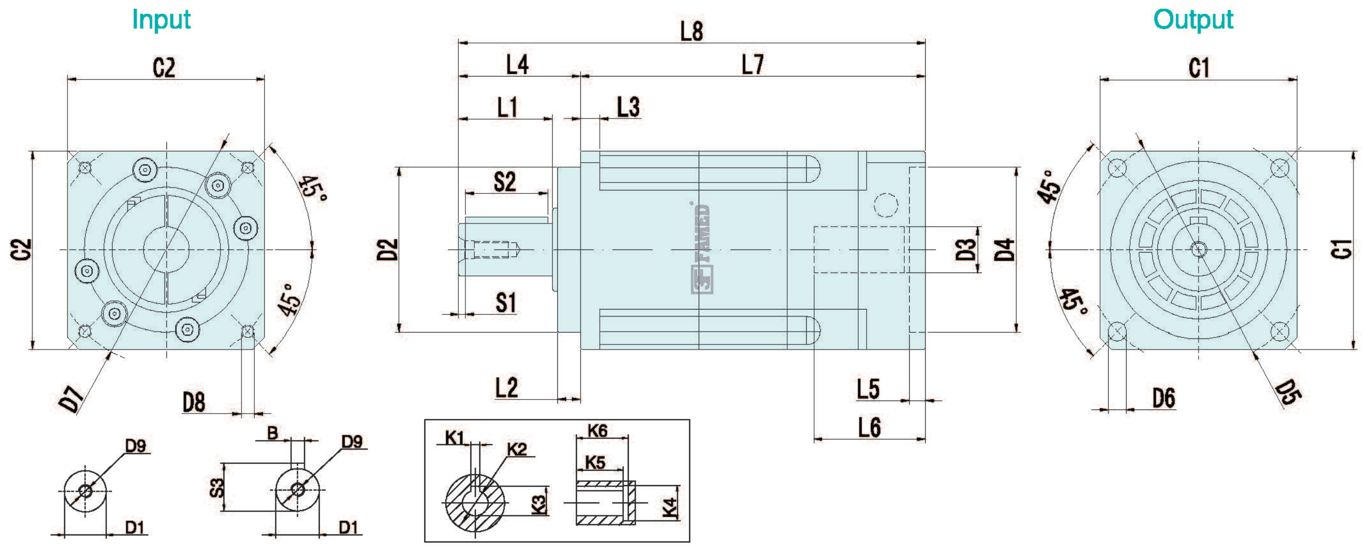
Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

MODEL：PAB

2–Stage

Ratio：12，15，16，20，25，28，30，35，40，50
70，80，100

Dimensions：



Output shaft type S1 Output shaft type S2 Output hole type S3

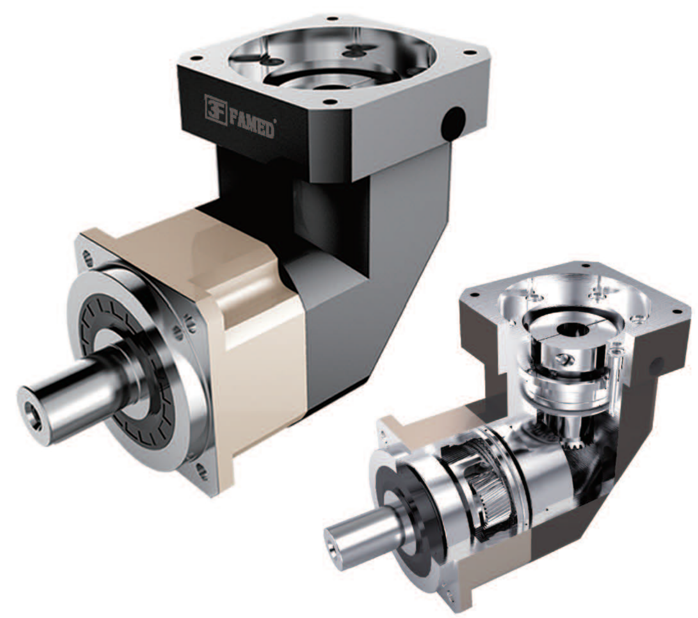
Unit:mm

Size	PAB042–L2	PAB060–L2	PAB090–L2	PAB115–L2	PAB142–L2	PAB180–L2	PAB220–L2	PAB242–L2	PAB285–L2	PAB330–L2
D1	ϕ13	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75	ϕ55	ϕ70	ϕ80
D2	ϕ35	ϕ50	ϕ80	ϕ110	ϕ130	ϕ160	ϕ180	ϕ220	ϕ250	ϕ290
D3	ϕ8(≤11)	ϕ14(≤14)	ϕ19	ϕ24(≤32)	ϕ35(≤42)	ϕ38(≤50)	ϕ55(≤55)	ϕ38(≤42)	ϕ42	ϕ42
D4	ϕ30(30–50)	ϕ50(30–70)	ϕ70	ϕ110(50–130)	ϕ114.3(95–180)	ϕ180(95–180)	ϕ215(180–255)	ϕ200(114.3–200)	ϕ200(114.3–200)	ϕ200(114.3–200)
D5	ϕ50	ϕ70	ϕ100	ϕ130	ϕ165	ϕ215	ϕ250	ϕ265	ϕ315	ϕ370
D6	4–ϕ3.4	4–ϕ5.5	4–ϕ6.6	4–ϕ9	4–ϕ11	4–ϕ13	4–ϕ17	4–ϕ18	4–ϕ18	4–ϕ22
D7	ϕ46(22–70)	ϕ70(45–90)	ϕ90	ϕ145(70–145)	ϕ200(90–215)	ϕ200(90–300)	ϕ235(200–300)	ϕ200(200–235)	ϕ200(200–235)	ϕ200(200–235)
D8	(4–M3X8L)	(4–M5X10L)	(4–M6X12L)	(4–M8X25L)	(4–M12X30L)	(4–M12X30L)	(4–M12X30L)	4–M12	4–M12	4–M12
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2.0P	M20X2.5P	M20X2.5P	M20X40	M16X35	M16X35
L1	19	28.5	36.5	51	79	82	105	105	110	120
L2	5.5	7	10	12	15	20	30	20	20	25
L3	4	6	8	10	12	15	20	22	25	30
L4	26	37	48	65	97	105	138	130	135	150
L5	(4)	(5)	(7)	(11)	(7)	(7)	(12.5)	7	15	15
L6	25	34	45	65	67.5	85	105	120(≤120)	118	118
L7	(93)	(117)	(144)	(161)	(196)	(232)	(277)	325	402.5	459
L8	(114)	(154)	(192)	(226)	(293)	(337)	(415)	455(≤455)	537.5	609
C1	□42	□60	□90	□115	□142	□180	□220	□242	□285	□330
C2	(□42)	(□60)	(□90)	(□130)	(□142)	(□180)	(□220)	180(≤180)	220	220
S1	2	2	3	5	5	5	7	5	5	5
S2	16	25	32	40	65	70	90	90	100	110
S3	15	18	24.5	35	43	59	79	74.5	74.5	85
B	5	5	6	10	12	16	20	20	20	22
K1	–	4	6	8	10	14	16	–	–	–
K2	–	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50	ϕ60	–	–	–
K3	–	12.7	25	31.3	42	53.8	64.4	–	–	–
K4	–	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60	ϕ72	–	–	–
K5	–	15	20	27	35	43	60	–	–	–
K6	–	18	24	32	40	50	65	–	–	–

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

High Precision High Torque Right Angle Planetary Gearbox

PAR



- 1. Space–saving
  The straight cross reducer uses spiral bevel gear. The installation of the motor can achieve 90 degree bending and save the installation space.
- 2. High rigidity & torqueThe use of integral needle roller bearings greatly improves the rigidity and torque.
- 3. Connector and shaft sleeve mode
  It can be installed on any motor in the world.
- 4. No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 5. Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

PAR Type

PAR090 – 10 – S1 – P1 / Motor

Reducer Model

PAR042，PAR060，PAR090，PAR115
PAR142，PAR180，PAR220，PAR240
PAR280，PAR300

Output Shaft Keyway

S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model

Motor Manufacturer & Model

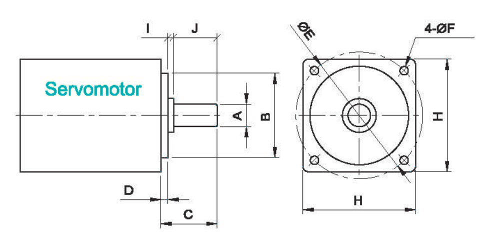
Ratio

1–stage：3，4，5，6，7，8，9，10
2–stage：15，20，25，30，35，40，50，70，
80，100，120，140，160，180，200

Backlash Grade

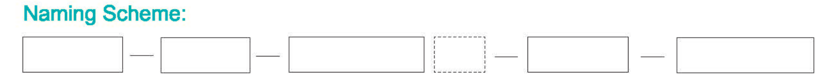
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:



Type — Model — Ratio — Output Shaft Keyway — Backlash Class — MOTOR NO.

PAR Reducer Specifications

Specs	Unit	Stage	Ratio	PAR042	PAR060	PAR090	PAR115	PAR142	PAR180	PAR220
Rated Output Torque / T2N	Nm	1	3	20	55	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	50	140	290	542	1050	1700
			9	14	40	100	230	450	900	1500
			10	14	60	160	330	650	1200	2000
			14	19	50	140	300	550	1100	1800
			20	14	40	100	230	450	900	1500
		2	15	20	55	130	208	342	588	1140
			20	20	50	140	290	542	1050	1700
			25	22	60	160	330	650	1200	2000
			30	22	55	130	208	342	588	1140
			35	22	60	160	330	650	1200	2000
			40	22	50	140	290	542	1050	1700
			50	22	60	160	330	650	1200	2000
			70	22	60	160	330	600	1200	2000
			80	22	50	140	290	542	1050	1700
			100	22	60	160	330	650	1200	2000
			120	—	—	150	310	600	1100	1900
			140	—	—	140	300	550	1100	1800
			160	—	—	120	260	500	1000	1600
			180	—	—	98	225	445	895	1495
			200	—	—	100	230	450	900	1500
Max.Output Torque / T_{2NOT} [1]	Nm	1,2	3~200	3Times of Nominal Output Torque						
Rated Input Speed / n_{1N}	rpm	1,2	3~200	3000	3000	3000	3000	2500	2000	2000
Max.Input Speed / n_{1B}	rpm	1,2	3~200	6000	6000	6000	5500	4500	4500	4000
Precision Backlash P0	arcmin	1	3~20	≤1	≤1	≤1	≤1	≤1	≤1	≤1
		2	15~200	≤3	≤3	≤3	≤3	≤3	≤3	≤3
Precision Backlash P1	arcmin	1	3~20	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	15~200	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Standard Backlash P2	arcmin	1	3~20	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	15~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional Rigidity	Nm/arcmin	1,2	3~200	3	6	14	25	56	140	220
Max.Radial Force / F_{2rB} [2]	N	1,2	3~200	780	1300	3200	6750	9400	14500	50000
Max.Axial Force / F_{2aB} [2]	N	1,2	3~200	330	700	1580	3300	4700	7200	28000
Service Life	hr	1,2	3~200	21000 h						
Efficiency / η	%	1	3~20	≥93%						
		2	25~200	≥90%						
Weight	kg	1	3~20	0.9	1.5	6.4	13	24.5	51	83
		2	25~200	1.2	2.1	7.8	14.2	27.5	54	95
Operating Temperature	℃	1,2	3~200	(–15℃ ~ +90℃)						
Lubrication		1,2	3~200	(Synthetic Grease)						
Protection Class		1,2	3~200	IP65						
Mounting Position		1,2	3~200	(Any Direction)						
Noise Level (n1=3000rpm，No load)	dB(A)	1,2	3~200	≤65	≤65	≤68	≤68	≤70	≤72	≤74

Reducer Rotary Inertia

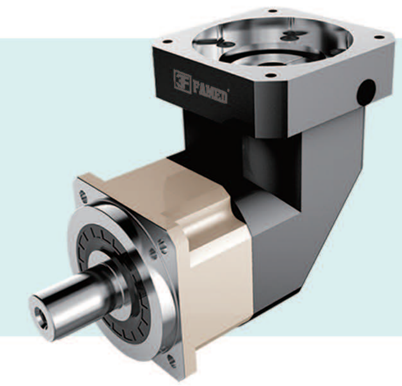
Specs	Unit	Stage	Ratio	PAR042	PAR060	PAR090	PAR115	PAR142	PAR180	PAR220
Moment of Inertia	kg.cm²	1	3~10	0.09	0.35	2.25	6.84	23.4	68.9	135.4
			14~20	0.03	0.07	1.87	6.25	21.8	65.6	119.8
		2	15~100	0.09	0.09	0.35	2.25	6.84	23.4	68.9
			120~200	—	—	0.31	1.87	6.25	21.8	65.6

1. The Max. acceleration torque T2B=60% of T2NOT 2. When output speed is 100rpm, inertia acts on the output shaft center position.
3. 3-stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

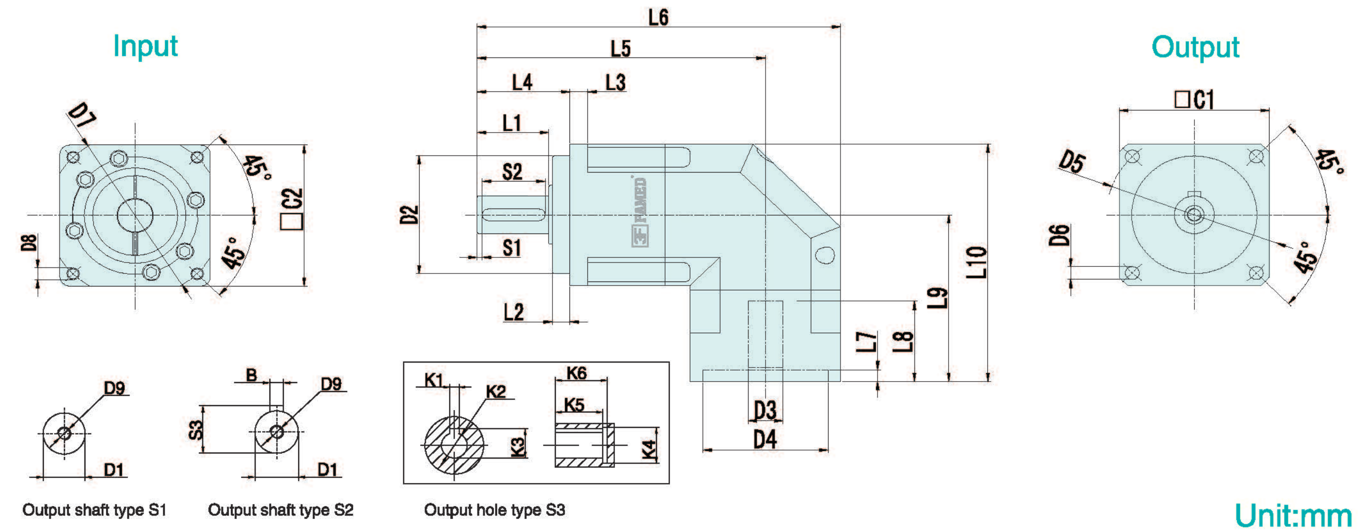
MODEL：PAR

1–Stage

Ratio：3，4，5，6，7，8，9，10，14，16，20



Dimensions：



Unit:mm

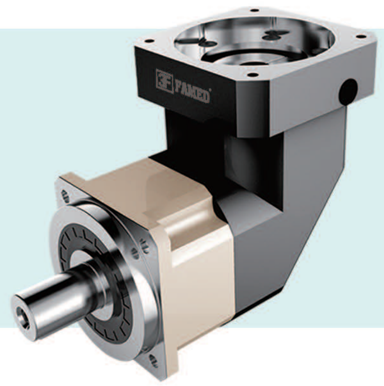
Size	PAR042–L1	PAR060–L1	PAR090–L1	PAR115–L1	PAR142–L1	PAR180–L1	PAR220–L1
D1	ϕ13	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75
D2	ϕ35	ϕ50	ϕ80	ϕ110	ϕ130	ϕ160	ϕ180
D3	ϕ8(≤11)	ϕ14(≤14)	ϕ19(≤24)	ϕ24(≤32)	ϕ35(≤42)	ϕ38(≤50)	ϕ55(≤55)
D4	ϕ30(30–50)	ϕ50(30–70)	ϕ70(50–110)	ϕ110(50–130)	ϕ114.3(95–180)	ϕ180(95–180)	ϕ215(180–255)
D5	ϕ50	ϕ70	ϕ100	ϕ130	ϕ165	ϕ215	ϕ250
D6	4–ϕ3.4	4–ϕ5.5	4–ϕ6.6	4–ϕ9	4–ϕ11	4–ϕ13	4–ϕ17
D7	ϕ46(22–70)	ϕ70(45–90)	ϕ90(70–145)	ϕ145(70–145)	ϕ200(90–215)	ϕ200(90–300)	ϕ235(200–300)
D8	(4–M3X8L)	(4–M5X10L)	(4–M6X12L)	(4–M8X25L)	(4–M12X30L)	(4–M12X30L)	(4–M12X30L)
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2.0P	M20X2.5P	M20X2.5P
L1	19	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	96	117	175	227	255	289	346
L6	(122)	(154)	(223)	(292)	(352)	(394)	(484)
L7	(3.5)	(5)	(5)	(11)	(14)	(15)	(7)
L8	(30)	(34)	(44)	(60)	(81)	(85)	(85)
L9	(69.5)	(81.5)	(107.5)	(134)	(165)	(213.5)	(268.5)
L10	(95.5)	(110.5)	(158)	(199)	(230)	(303.5)	(378.5)
C1	□42	□60	□90	□115	□142	□180	□220
C2	(□42)	(□60)	(□90)	(□130)	(□142)	(□180)	(□220)
S1	2	2	2	5	5	5	7
S2	16	25	32	40	65	70	90
S3	15	18	24.5	35	43	59	79
B	5	5	6	10	12	16	20
K1	–	4	6	8	10	14	16
K2	–	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50	ϕ60
K3	–	12.7	25	31.3	42	53.8	64.4
K4	–	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60	ϕ72
K5	–	15	20	27	35	43	60
K6	–	18	24	32	40	50	65

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

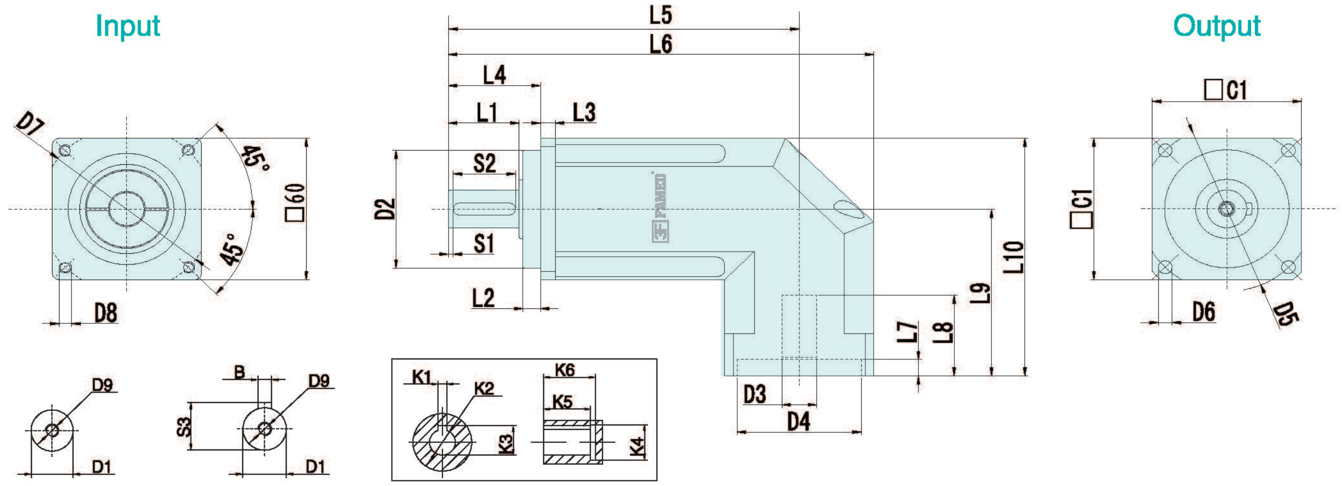
MODEL：PAR

2-Stage

Ratio：15，20，25，30，35，40，50，70，80，
100，120，140，160，180，200



Dimensions：



Output shaft type S1　Output shaft type S2　Output hole type S3

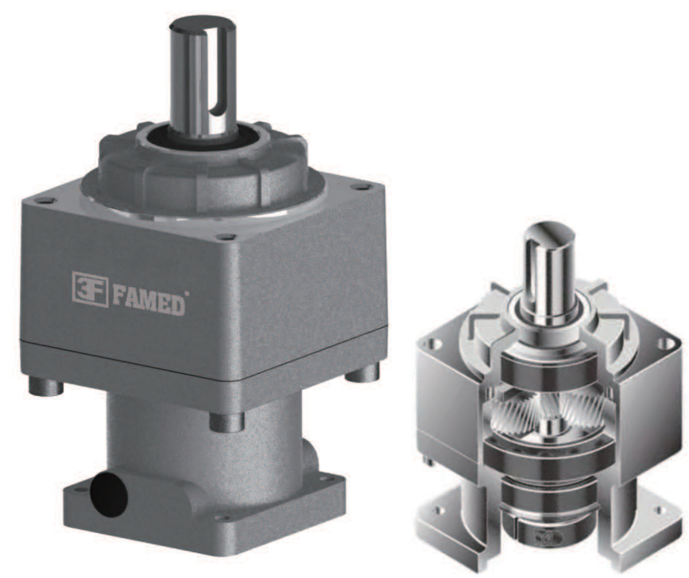
Unit:mm

Size	PAR042-L2	PAR060-L2	PAR090-L2	PAR115-L2	PAR142-L2	PAR180-L2	PAR220-L2
D1	ϕ13	ϕ16	ϕ22	ϕ32	ϕ40	ϕ55	ϕ75
D2	ϕ35	ϕ50	ϕ80	ϕ110	ϕ130	ϕ160	ϕ180
D3	ϕ8(≤11)	ϕ14(≤14)	ϕ14	ϕ24(≤32)	ϕ35(≤42)	ϕ38(≤50)	ϕ55(≤55)
D4	ϕ30(30-50)	ϕ50(30-70)	ϕ50	ϕ110(50-130)	ϕ114.3(95-180)	ϕ180(95-180)	ϕ215(180-255)
D5	ϕ50	ϕ70	ϕ100	ϕ130	ϕ165	ϕ215	ϕ250
D6	4-ϕ3.4	4-ϕ5.5	4-ϕ6.6	4-ϕ9	4-ϕ11	4-ϕ13	4-ϕ17
D7	ϕ46(22-70)	ϕ70(45-90)	ϕ70	ϕ145(70-145)	ϕ200(90-215)	ϕ200(90-300)	ϕ235(200-300)
D8	(4-M3X8L)	(4-M5X10L)	(4-M5X12L)	(4-M8X25L)	(4-M12X30L)	(4-M12X30L)	(4-M12X30L)
D9	M4X0.7P	M5X0.8P	M8X1.25P	M12X1.75P	M16X2.0P	M20X2.5P	M20X2.5P
L1	19	28.5	36.5	51	79	82	105
L2	5.5	7	10	12	15	20	30
L3	4	6	8	10	12	15	20
L4	26	37	48	65	97	105	138
L5	113	134	157	224	282	322	383
L6	139	171	205	(292)	(378)	(427)	(521)
L7	(3.5)	(5)	(5)	(11)	(14)	(15)	(7)
L8	(30)	(34)	(44)	(60)	(81)	(85)	(85)
L9	(69.5)	(81.5)	(107.5)	(134)	(165)	(213.5)	(268.5)
L10	(90.5)	(111.5)	(152.5)	(191.5)	(236)	(303.5)	(378.5)
C1	□42	□60	□90	□115	□142	□180	□220
C2	(□42)	(□60)	(□90)	(□130)	(□142)	(□180)	(□220)
S1	2	2	2	5	5	5	7
S2	16	25	32	40	65	70	90
S3	15	18	24.5	35	43	59	79
B	5	5	6	10	12	16	20
K1	–	4	6	8	10	14	16
K2	–	ϕ11	ϕ22	ϕ28	ϕ38	ϕ50	ϕ60
K3	–	12.7	25	31.3	42	53.8	64.4
K4	–	ϕ16	ϕ32	ϕ38	ϕ48	ϕ60	ϕ72
K5	–	15	20	27	35	43	60
K6	–	18	24	32	40	50	65

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

Precision Planetary Gearbox

VRSF



- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 3.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

VRSF Type

VRSF080 – 10 – S1 – P1 / Motro

Reducer Model

VRSF060，VRSF080
VRSF100，VRSF125

Output Shaft Keyway

S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model

Motor Manufacturer & Model

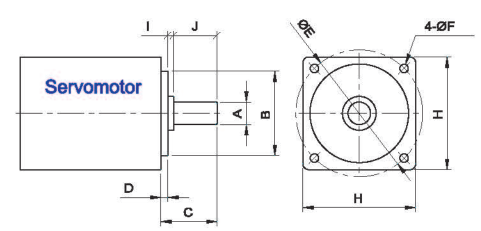
Ratio

1-stage：3，4，5，7，10
2-stage：15，20，25，30，35，40，50，70，100

Backlash Grade

P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type – Model – Ratio – Output Shaft Keyway – Backlash Class – MOTOR NO.

VRSF Reducer Specifications

Specs	Unit	Stage	Ratio	VRSF060	VRSF080	VRSF100	VRSF125
Rated Output Torque / T2N	Nm	1	3	54	112	165	286
			4	48	110	146	255
			5	45	108	160	264
			7	41	105	149	245
			10	40	100	141	234
		2	15	54	112	165	286
			20	48	110	146	255
			25	45	108	160	264
			30	41	112	165	286
			35	41	105	149	245
			40	39	110	146	255
			50	45	108	160	264
			70	41	105	149	245
			100	40	100	141	234
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque			
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000
Precision Backlash P1	arcmin	1	3~10	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7
Standard Backlash P2	arcmin	1	3~10	≤8	≤8	≤8	≤8
		2	12~100	≤10	≤10	≤10	≤10
Torsional Rigidity	Nm/arcmin	1,2	3~100	5	12	14	23
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	800	1200	3200	5220
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	400	600	1600	2600
Service Life	hr	1,2	3~100	21000 h			
Efficiency / η	%	1	3~10	≥97%			
		2	15~100	≥94%			
Weight	kg	1	3~10	1.2	1.6	3.76	7.43
		2	15~100	2.1	2.8	5.92	10.3
Operating Temperature	℃	1,2	3~100	−25℃~+90℃			
Lubrication		1,2	3~100	Synthetic Grease			
Protection Class		1,2	3~100	Any Direction			
Mounting Position		1,2	3~100				
Noise Level (n1=3000rpm，No load)	dB(A)	1,2	3~100	≤60	≤62	≤65	≤67

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	VRSF060	VRSF080	VRSF100	VRSF125
Moment of Inertia	$kg.cm^2$	1	3	0.16	0.61	3.25	9.21
			4	0.14	0.48	2.74	7.54
			5	0.13	0.47	2.71	7.42
			6	0.13	0.45	2.65	7.25
			7	0.13	0.45	2.62	7.14
			8	0.13	0.44	2.58	7.07
			9	0.13	0.44	2.57	7.04
			10	0.13	0.44	2.57	7.03
		2	12~40	0.03	0.13	0.47	2.71
			50~100	0.03	0.13	0.44	2.57

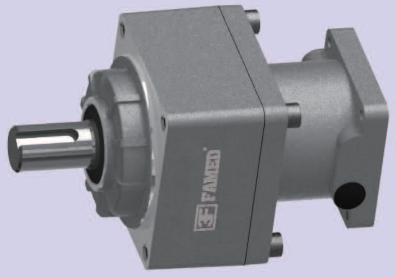
1. Ratio (i=Nin/Nout)　2. The Max. acceleration torque T2B=60% of T2NOT

3. When output speed is 100rpm, inertia acts on the output shaft center position.continuous operation, service life is 15000hrs.

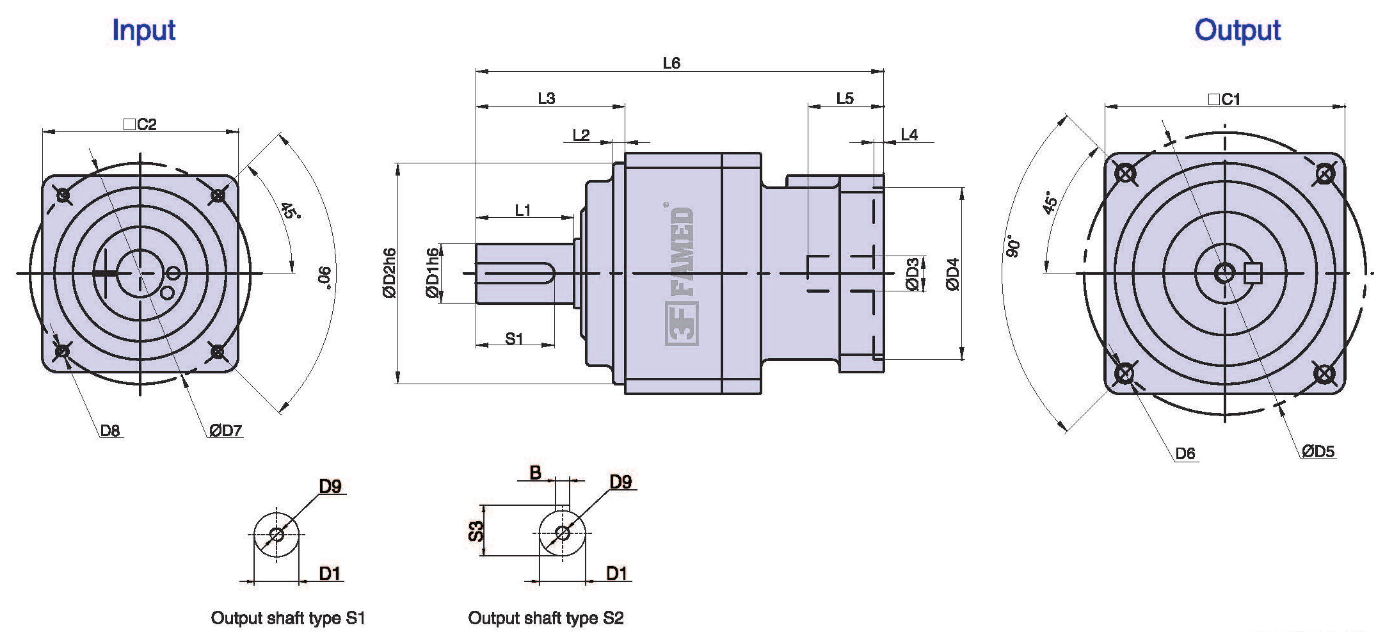
MODEL：VRSF

1–Stage

Ratio：3，4，5，7，10



Dimensions



Unit:mm

Size	VRSF060–L1	VRSF080–L1	VRSF100–L1	VRSF125–L1
D1	12	19	24	32
D2	50	70	90	110
D3	8(8～14)	14(14～19)	19	22(22～24)
D4	30(30～50)	50(50～70)	70	110
D5	60	90	115	135
D6	M5	M6	M8	M10
D7	45(45～70)	70(70～90)	90	145
D8	M4～M5	M4～M5	M6	M8
D9	M4	M6	M8	M12
L1	20	30	40	55
L2	3	3	5	5
L3	32	50	61	75
L4	4	4	4	8
L5	27～32	32	38	65.5
L6	109	143.5～148.5	177	215.5
C1	52	78	98	125
C2	40(40～52)	60(60～80)	90	125(125～130)
S1	18	22	32	52
S2	13.5	21.5	27	35
B	4	6	6	10

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.

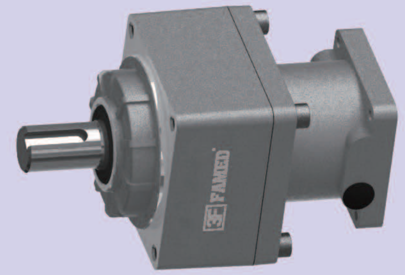
Note 2: The reducer output shaft size and length can be customized for customers.

Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

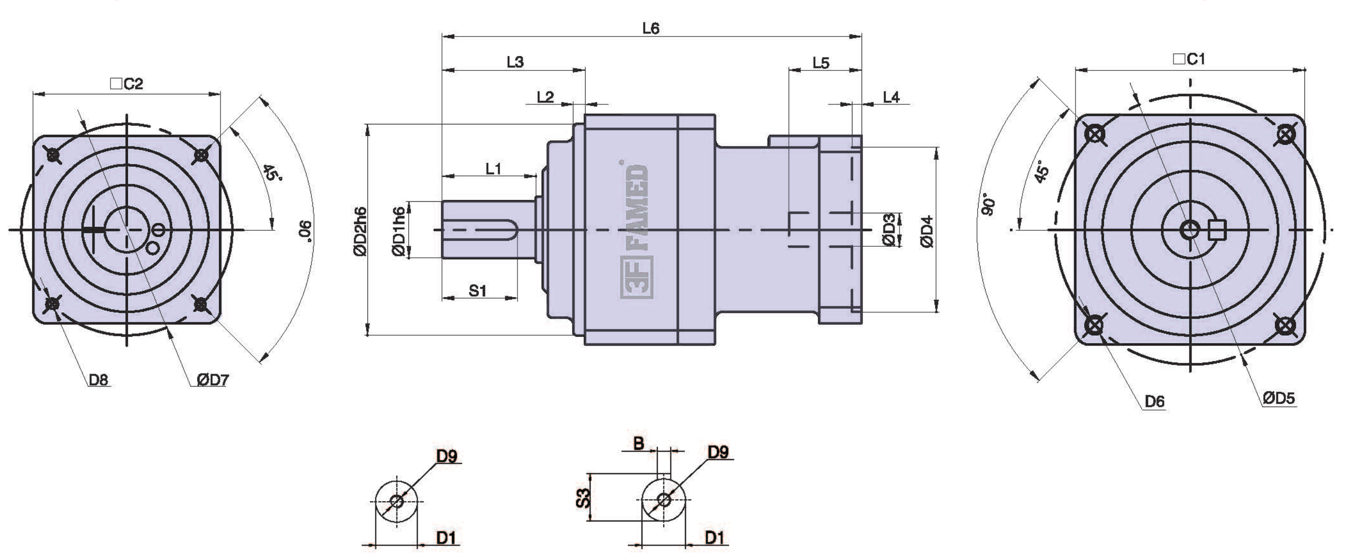
MODEL：VRSF

2–Stage

Ratio：15, 20, 25, 30, 35, 40, 50, 70, 100



Dimensions：



Output shaft type S1

Output shaft type S2

Unit:mm

Size	VRSF060–L2	VRSF080–L2	VRSF100–L2	VRSF125–L2
D1	12	19	24	32
D2	50	70	90	110
D3	11(11～14)	14(14～19)	14～19	22(22～24)
D4	50	50(50～70)	50(50～70)	110
D5	60	90	115	135
D6	M5	M6	M8	M10
D7	45(45～70)	70(70～90)	70～90	145
D8	M4～M5	M4～M5	M4～M5	M8
D9	M4	M6	M8	M12
L1	20	30	40	55
L2	3	3	5	5
L3	32	50	61	75
L4	4	4	4	8
L5	32	32	38	65.5
L6	109	150～155	165～179	250.5
C1	52	78	98	125
C2	52	60(60～80)	60(60～80)	125(125～130)
S1	18	22	32	52
S2	13.5	21.5	27	35
B	4	6	8	10

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

Precision Planetary Gearbox

FB

- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 3.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

FB Type

FB090 – 10 – S1 – P1 / Motor

Reducer Model

FB040, FB060, FB090
FB120, FB160

Output Shaft Keyway

S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model

Motor Manufacturer & Model

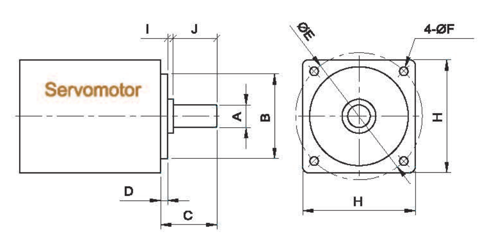
Ratio

1–stage：3,4,5,6,7,8,9,10
2–stage：12,15,16,20,25,28,30,35,40,50,70,80,100
3–stage：60,64,72,80,90,100,120,144,150,160,180,200, 240,258,288,320,384,512,600,800,1000

Backlash Grade

P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type – Model – Ratio – Output Shaft Keyway – Backlash Class – MOTOR NO.

FB Reducer Specifications

Specs	Unit	Stage	Ratio	FB040	FB060	FB090	FB120	FB160
Rated Output Torque / T2N	Nm	1	3	20	55	130	208	342
			4	19	50	140	290	542
			5	22	60	160	330	650
			7	19	50	140	300	550
			10	14	40	100	230	450
		2	15	20	55	130	208	342
			20	19	50	145	290	542
			25	22	60	160	330	650
			30	22	55	130	208	342
			35	22	60	160	330	650
			40	22	50	140	290	542
			50	20	60	160	330	650
			70	19	50	140	300	550
			100	14	40	100	230	450
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque				
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000	2500
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3
		2	12~100	≤5	≤5	≤5	≤5	≤5
Standard Backlash P2	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	22	50
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	320	460	1300	3200	6520
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	160	230	660	1600	3260
Service Life	hr	1,2	3~100	20000 h				
Efficiency / η	%	1	3~10	≥97%				
		2	15~100	≥94%				
Weight	kg	1	3~10	0.73	0.99	2.1	4.98	18.2
		2	15~100	1.05	1.46	3.2	6.92	24.9
Operating Temperature	℃	1,2	3~100	-25℃~+90℃				
Lubrication		1,2	3~100	Synthetic Grease				
Protection Class		1,2	3~100	IP65				
Mounting Position		1,2	3~100	Any				
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤67	≤68

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	FB040	FB060	FB090	FB120	FB160
Moment of Inertia	$kg.cm^2$	1	3	0.03	0.16	0.61	3.25	9.21
			4	0.03	0.14	0.48	2.74	7.54
			5	0.03	0.13	0.47	2.71	7.42
			7	0.03	0.13	0.45	2.65	7.25
			10	0.03	0.13	0.45	2.62	7.14
		2	12–40	0.03	0.13	0.44	2.58	7.07
			50–100	0.03	0.13	0.44	2.57	7.04

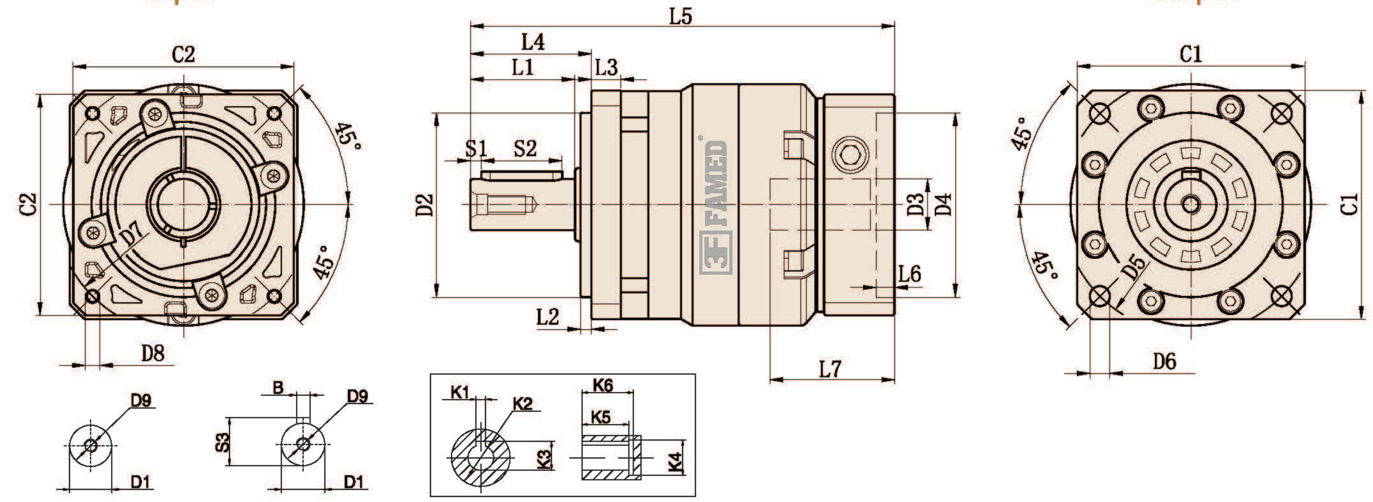
1. Ratio (i=Nin/Nout)　　2. Output revolutions 100rpm, acting on the output shaft center position.
3. *Continuous operation, service life is 10000hrs.

MODEL: FB

1-Stage
Ratio: 3, 4, 5, 6, 7, 8, 9, 10

Dimensions:

Input　　Output



Output shaft type S1　　Output shaft type S2　　Output hole type S3

Unit:mm

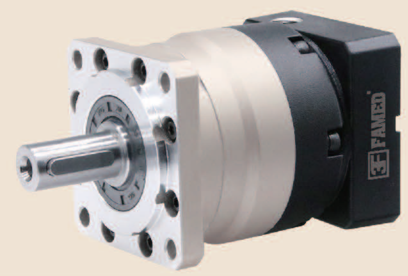
Size	FB040-L1	FB060-L1	FB090-L1	FB120-L1	FB160-L1
D1	ϕ12(13)	ϕ14(16)	ϕ20(22)	ϕ25(32)	ϕ40
D2	ϕ26	ϕ50	ϕ80	ϕ110	ϕ130
D3	ϕ8(≤11)	ϕ14(≤19)	ϕ19(≤24)	ϕ24(≤32)	ϕ35(42)
D4	ϕ30(30-50)	ϕ50 (50-70)	ϕ70 (50-110)	ϕ110(70-130)	ϕ114.3(110-150)
D5	ϕ48	ϕ70	ϕ100	ϕ130	ϕ185(165)
D6	4-ϕ3.4	4-ϕ5.5	4-ϕ7	4-ϕ9	4-ϕ11
D7	ϕ46(45-70)	ϕ70 (70-130)	ϕ90 (70-145)	ϕ145(90-165)	ϕ200(145-220)
D8	(4-M4X8L)	(4-M4*10L)	(4-M5*12L)	(4-M8X25L)	(4-M12X25L)
D9	M4X0.7P	M5*0.8P*15L	M6*1.0P*16.5L	M10X1.5P	M16X2.0P
L1	18	28.5	36.5	50	80
L2	3	3	3	4	5
L3	4	8	10	15	16
L4	22.5	33	40.5	55	87
L5	(5)	(115.5)	(147)	(8)	(7)
L6	(32)	(5)	(6.5)	(59)	(86)
L7	(88)	(34)	(42)	(211)	(292)
C1	□45	□62	□90	□124	□175
C2	(□50)	(□60)	(□80)	(□120)	(□176)
S1	2	3	4	5	8
S2	14	22	28	40	65
S3	13.5	16	22.5	28	43
B	4	5	6	8	12
K1	-	3	6	8	10
K2	-	ϕ8	ϕ18	ϕ25	ϕ35
K3	-	9.2	21	28	38.3
K4	-	ϕ11	ϕ24	ϕ32	ϕ42
K5	-	20	30	40	52
K6	-	24	35	48	58

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

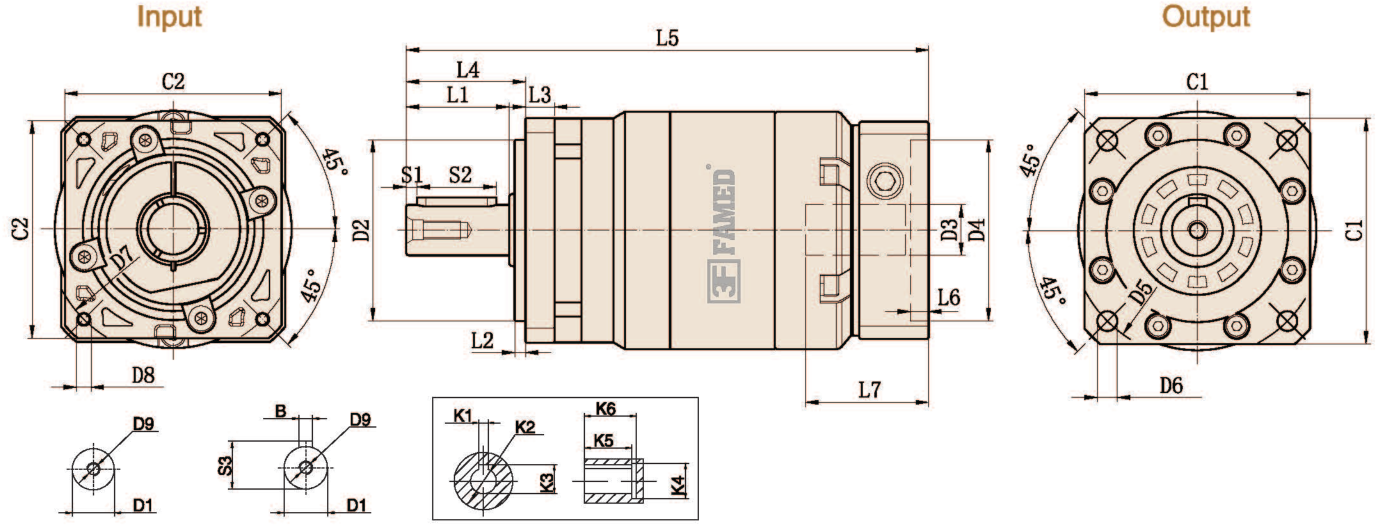
MODEL：FB

2–Stage

Ratio：12，15，16，20，25，28，30，35，40，50
70，80，100



Dimensions：



Output shaft type S1　Output shaft type S2　Output hole type S3

Unit:mm

Size	FB040–L2	FB060–L2	FB090–L2	FB120–L2	FB160–L2
D1	ϕ12(13)	ϕ14(16)	ϕ20(22)	ϕ25(32)	ϕ40
D2	ϕ26	ϕ50	ϕ80	ϕ110	ϕ130
D3	ϕ8(≤11)	ϕ14(≤19)	ϕ19(≤24)	ϕ24(≤32)	ϕ35(42)
D4	ϕ30(30–50)	ϕ50（50–70）	ϕ70（50–110）	ϕ110（70–130）	ϕ114.3(110–150)
D5	ϕ48	ϕ70	ϕ100	ϕ130	ϕ185(165)
D6	4–ϕ3.4	4–ϕ5.5	4–ϕ7	4–ϕ9	4–ϕ11
D7	ϕ46(45–70)	ϕ70（70–130）	ϕ90（70–145）	ϕ145（90–165）	ϕ200(145–220)
D8	(4–M4X8L)	(4–M4*10L)	(4–M5*12L)	(4–M8*20L)	(4–M12X25L)
D9	M4X0.7P	M5*0.8P*15L	M6*1.0P*16.5L	M10*1.5P*23L	M16X2.0P
L1	18	28.5	36.5	50	80
L2	3	3	3	4	5
L3	4	8	10	15	16
L4	22.5	33	40.5	55	87
L5	(5)	(144.5)	(177.5)	(232.5)	(7)
L6	(32)	(5)	(6.5)	(11)	(86)
L7	(105)	(34)	(42)	(59)	(295)
C1	□45	□62	□90	□120	□175
C2	(□50)	(□60)	(□80)	(□130)	(□176)
S1	2	3	4	5	8
S2	14	22	28	40	65
S3	13.5	16	22.5	28	43
B	4	5	6	8	12
K1	–	3	6	8	10
K2	–	ϕ8	ϕ18	ϕ25	ϕ35
K3	–	9.2	21	28	38.3
K4	–	ϕ11	ϕ24	ϕ32	ϕ42
K5	–	20	30	40	52
K6	–	24	35	48	58

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

Precision Right Angle Planetary Gearbox

FBR

- 1. Space–saving
  The straight cross reducer uses spiral bevel gear. The installation of the motor can achieve 90 degree bending and save the installation space.
- 2.High rigidity & torque
  The use of integral ball bearings greatly improves the rigidity and torque.
- 3. Connector and shaft sleeve mode
  It can be installed on any motor in the world.
- 4. No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 5.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

FBR Type

FBR090 – 10 – S1 – P1 / Motor

Reducer Model
FBR040，FBR060，FBR090
FBR120，FBR160

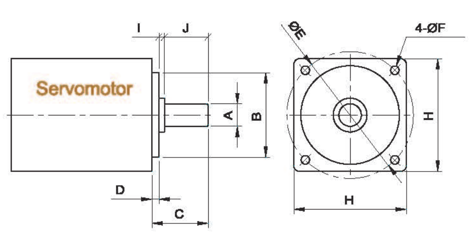
Output Shaft Keyway
S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3,4,5,6,7,8,9,10
2–stage：12,15,16,20,25,28,30,35,40,50,70,80,100
3–stage：60,64,72,80,90,100,120,144,150,160,180,200
240,258,288,320,384,512,600,800,1000

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type – Model – Ratio – Output Shaft Keyway – Backlash Class – MOTOR NO.

FBR Reducer Specifications

Specs	Unit	Stage	Ratio	FBR040	FBR060	FBR090	FBR120	FBR160
Rated Output Torque / T2N	Nm	1	3	20	55	130	208	342
			4	19	50	140	290	542
			5	22	60	160	330	650
			7	19	50	140	300	550
			10	14	40	100	230	450
		2	15	20	55	130	208	342
			20	19	50	145	290	542
			25	22	60	160	330	650
			30	22	55	130	208	342
			35	22	60	160	330	650
			40	22	50	140	290	542
			50	20	60	160	330	650
			70	19	50	140	300	550
			100	14	40	100	230	450
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque				
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000	2500
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤8	≤8	≤8	≤8	≤8
		2	12~100	≤10	≤10	≤10	≤10	≤10
Standard Backlash P2	arcmin	1	3~10	≤11	≤11	≤11	≤11	≤11
		2	12~100	≤13	≤13	≤13	≤13	≤13
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	22	50
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	320	460	1300	3200	6520
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	160	230	660	1600	3260
Service Life	hr	1,2	3~100	20000 h				
Efficiency / η	%	1	3~10	≥97%				
		2	15~100	≥94%				
Weight	kg	1	3~10	0.73	0.99	2.1	4.98	18.2
		2	15~100	1.05	1.46	3.2	6.92	24.9
Operating Temperature	℃	1,2	3~100	–25℃~+90℃				
Lubrication		1,2	3~100	Synthetic Grease				
Protection Class		1,2	3~100	IP65				
Mounting Position		1,2	3~100	Any Direction				
Noise Level (n1=3000rpm，No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤67	≤68

Reducer Rotary Inertia

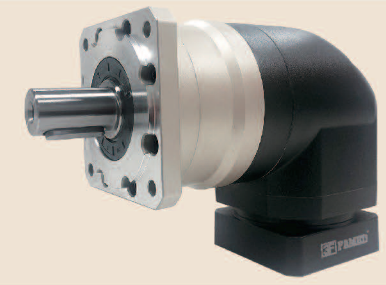
Specs	Unit	Stage	Ratio	FBR040	FBR060	FBR090	FBR120	FBR160
Moment of Inertia	$kg.cm^2$	1	3	0.03	0.16	0.61	3.25	9.21
			4	0.03	0.14	0.48	2.74	7.54
			5	0.03	0.13	0.47	2.71	7.42
			7	0.03	0.13	0.45	2.65	7.25
			10	0.03	0.13	0.45	2.62	7.14
		2	12–40	0.03	0.13	0.44	2.58	7.07
			50–100	0.03	0.13	0.44	2.57	7.04

1. The Max. acceleration torque T2B=60%　　2.When output speed is 100rpm, acting on the output shaft center position
3. 3–stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

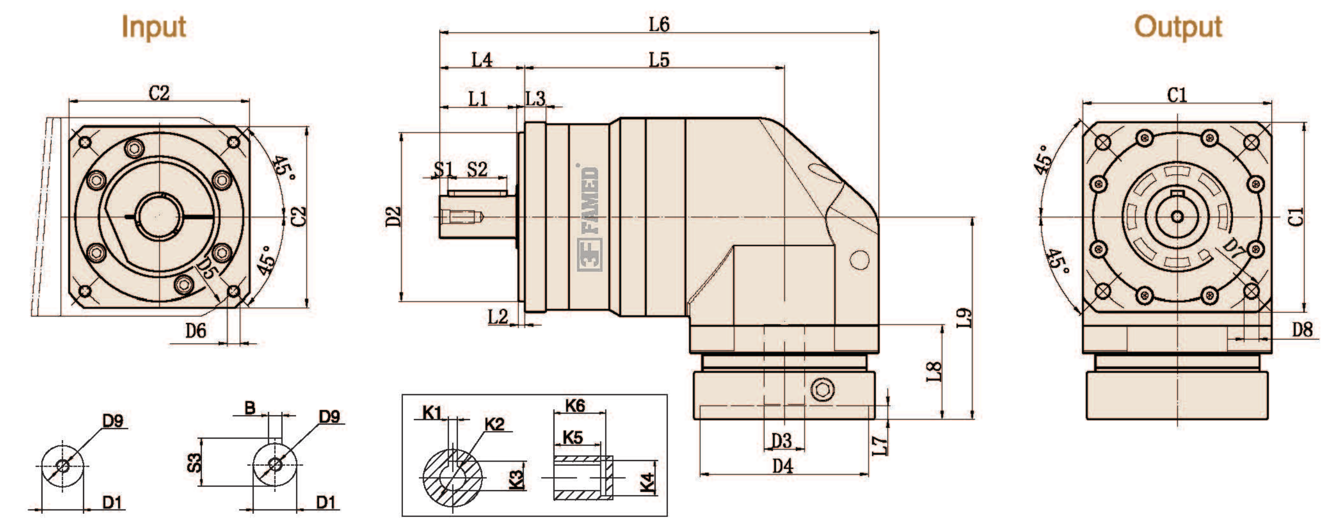
MODEL：FBR

1–Stage

Ratio：3, 4 , 5, 6, 7, 8, 9, 10



Dimensions：



Output shaft type S1　Output shaft type S2　Output hole type S3

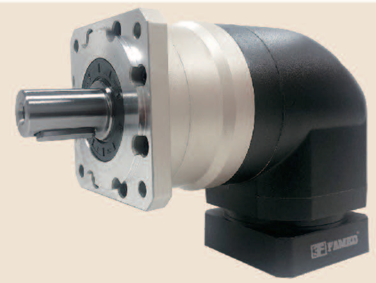
Unit:mm

Size	FBR060–L1	FBR090–L1	FBR120–L1	FBR160–L1
D1	ϕ14	ϕ20 (22)	ϕ25	ϕ40
D2	ϕ50	ϕ80	ϕ110	ϕ130
D3	ϕ14(6.35–19)	ϕ19 (ϕ11–24)	ϕ22(16–24)	ϕ35 (ϕ22–38)
D4	ϕ50 (50–70)	ϕ80 (50–110)	ϕ80 (50–110)	ϕ114.3 (ϕ110–114.3)
D5	ϕ70 (70–130)	ϕ100 (70–145)	ϕ145 (90–155)	ϕ200 (ϕ145–200)
D6	(4–M4*10L)	(4–M6*14L)	(4–M8*20L)	4–M12 (M8–M12)
D7	ϕ70	ϕ100	ϕ130	ϕ185
D8	4–ϕ5.5	4–ϕ7	4–ϕ9	4–ϕ11
D9	M5*0.8P*15L	M6*1.0P*16.5L	M10*1.5P*23L	M16X2P
L1	28.5	36.5	50	87
L2	3	3	4	78
L3	8	10	15	5
L4	33	40.5	55	20
L5	90	123.5	146.5	111
L6	153	209	259	295
L7	(5)	(6.5)	(10)	5 (5–7)
L8	(33)	(45)	(64)	86 (62–86)
L9	(77.5)	(96)	(135.5)	165.5 (165.5–189.5)
C1	□62	□90	□120	□160
C2	(□60)	(□86)	(□130)	□175 (142)
S1	3	4	5	5
S2	22	28	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	3	6	8	10
K2	ϕ8	ϕ18	ϕ28	ϕ38
K3	9.2	21	31.3	41.3
K4	ϕ11	ϕ24	ϕ38	ϕ48
K5	20	30	27	35
K6	24	35	32	40

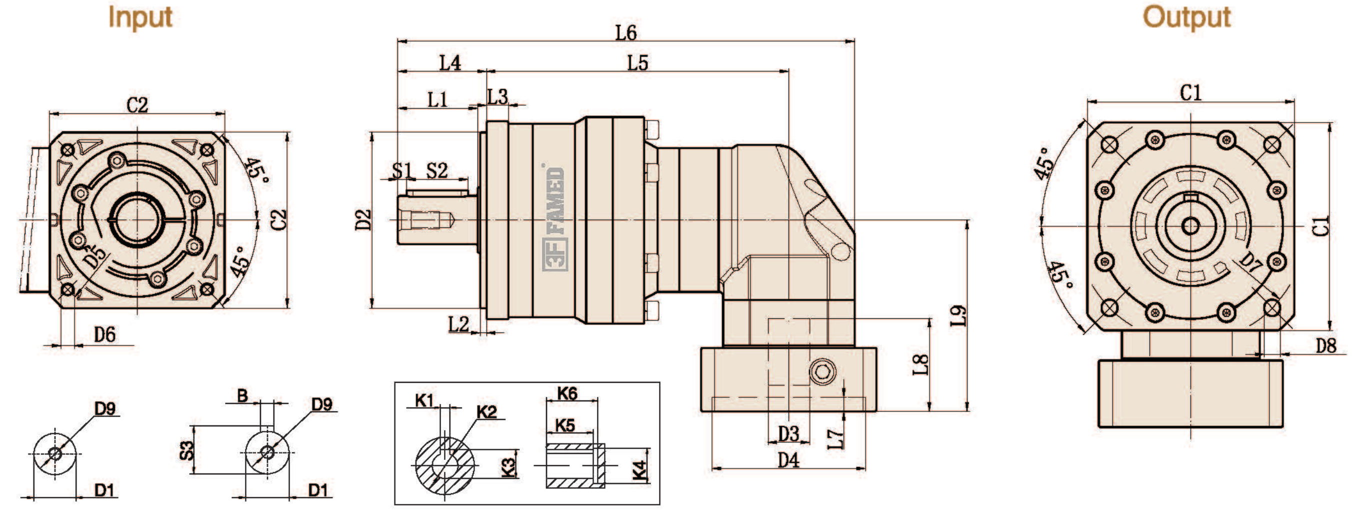
MODEL：FBR

2–Stage

Ratio：12，15，16，20，25，28，30，35，40，50
70，80，100



Dimensions：



Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

Size	FBR060–L2	FBR090–L2	FBR120–L2	FBR160–L2
D1	ϕ14	ϕ20（22）	ϕ25（32）	ϕ40
D2	ϕ50	ϕ80	ϕ110	ϕ130
D3	ϕ19(6.35–19)	ϕ19（ϕ11–24）	ϕ22（ϕ16–24）	ϕ35（ϕ22–38）
D4	ϕ70（50–70）	ϕ70（50–110）	ϕ110（ϕ55.5–110）	ϕ114.3（ϕ110–114.3）
D5	ϕ90（70–130）	ϕ90（70–145）	ϕ145（ϕ90–155）	ϕ200（ϕ145–200）
D6	（4–M4*10L)	（4–M6*14L)	4–M8（M6–M12）	4–M12（M8–M12）
D7	ϕ70	ϕ100	ϕ130	ϕ185
D8	4–ϕ5.5	4–ϕ7	4–ϕ8.5	4–ϕ11
D9	M5*0.8P*15L	M6*1.0P*16.5L	M10X1.5P	M16X2P
L1	28.5	36.5	55	87
L2	3	3	49	78
L3	8	10	4	5
L4	33	40.5	15	20
L5	119	138	110	149
L6	182	208.5	303	333
L7	(6.5)	(6.5)	8(5–8)	5（5–7）
L8	(42.5)	(42.5)	70（59–70）	86（62–86）
L9	(87)	(87)	130（119–130）	165.5（165.5–189.5）
C1	□62	□90	□120	□160
C2	（□80）	（□86)	130（120）	175（142）
S1	3	4	5	5
S2	22	28	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	3	6	8	10
K2	ϕ8	ϕ18	ϕ28	ϕ38
K3	9.2	21	31.3	41.3
K4	ϕ11	ϕ24	ϕ38	ϕ48
K5	20	30	27	35
K6	24	35	32	40

Precision Planetary Gearbox

FE

- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High precision
  The backlash is less than 3 arcmin and the positioning is accurate.
- 3.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 4.Methods of flange and connector
  It can be installed on any motor in the world.
- 5.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 6.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

FE Type

FE090 – 10 – S1 – P1 / Motor

Reducer Model

FE040，FE060，FE090
FE120，FE160

Output Shaft Keyway

S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model

Motor Manufacturer & Model

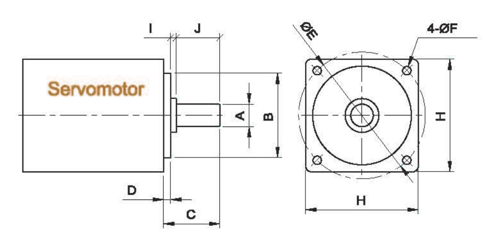
Ratio

1–stage：3,4,5,6,7,8,9,10
2–stage：12,15,16,20,25,28,30,35,40,50,70,80,100
3–stage：60,64,72,80,90,100,120,144,150,160,180,200
240,258,288,320,384,512,600,800,1000

Backlash Grade

P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type – Model – Ratio – Output Shaft Keyway – Backlash Class – MOTOR NO.

FE Reducer Specifications

Specs	Unit	Stage	Ratio	FE040	FE060	FE090	FE120	FE160
Rated Output Torque / T2N	Nm	1	3	20	55	130	208	342
			4	19	50	140	290	542
			5	22	60	160	330	650
			7	19	50	140	300	550
			10	14	40	100	230	450
		2	15	20	55	130	208	342
			20	19	50	145	290	542
			25	22	60	160	330	650
			30	22	55	130	208	342
			35	22	60	160	330	650
			40	22	50	140	290	542
			50	20	60	160	330	650
			70	19	50	140	300	550
			100	14	40	100	230	450
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque				
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000	2500
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3
		2	12~100	≤5	≤5	≤5	≤5	≤5
Standard Backlash P2	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	22	50
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	320	460	1300	3200	6520
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	160	230	660	1600	3260
Service Life	hr	1,2	3~100	20000 h				
Efficiency / η	%	1	3~10	≥97%				
		2	15~100	≥94%				
Weight	kg	1	3~10	0.73	0.99	2.1	4.98	18.2
		2	15~100	1.05	1.46	3.2	6.92	24.9
Operating Temperature	℃	1,2	3~100	-25℃~+90℃				
Lubrication		1,2	3~100	Synthetic Grease				
Protection Class		1,2	3~100	IP65				
Mounting Position		1,2	3~100	Any Direction				
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤67	≤68

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	FE040	FE060	FE090	FE120	FE160
Moment of Inertia	kg.cm²	1	3	0.03	0.16	0.61	3.25	9.21
			4	0.03	0.14	0.48	2.74	7.54
			5	0.03	0.13	0.47	2.71	7.42
			7	0.03	0.13	0.45	2.65	7.25
			10	0.03	0.13	0.45	2.62	7.14
		2	12-40	0.03	0.13	0.44	2.58	7.07
			50-100	0.03	0.13	0.44	2.57	7.04

1. Ratio (i=Nin/Nout) 2. Output revolutions 100rpm, acting on the output shaft center position.
3. *Continuous operation, service life is 10000hrs.

MODEL: FE

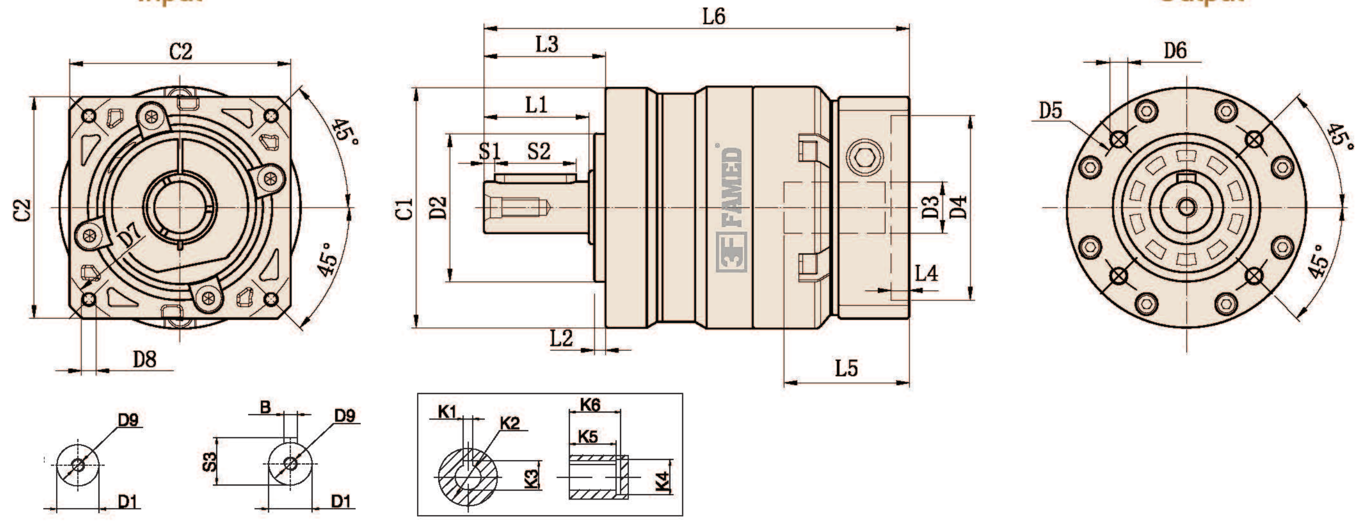
1-Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10

Dimensions:

Input

Output



Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

Size	FE040-L1	FE060-L1	FE090-L1	FE120-L1	FE160-L1
D1	ϕ12(13)	ϕ14(16)	ϕ20(22)	ϕ25(32)	ϕ40
D2	ϕ26	ϕ40	ϕ60	ϕ80	ϕ130
D3	ϕ8(≤11)	ϕ14(≤19)	ϕ19(≤24)	ϕ24(≤32)	ϕ35(42)
D4	ϕ30(30-50)	ϕ50 (50-70)	ϕ70 (50-70)	ϕ110 (70-130)	ϕ114.3(110-150
D5	ϕ34	ϕ52	ϕ70	ϕ100	ϕ145
D6	4-M4	4-M5*10	4-M6*12	4-M10*20	4-M12
D7	ϕ46(45-70)	ϕ70 (70-130)	ϕ90 (70-130)	ϕ145 (90-165)	ϕ200(145-220)
D8	(4-M4X8L)	(4-M4*10L)	(4-M5*12L)	(4-M8*20L)	(4-M12X25L)
D9	M4X0.7P	M5*0.8P*15L	M6*1.0P*16.5L	M10*1.5P*23L	M16X2.0P
L1	18	28.5	36.5	50	80
L2	2	3	3	4	5
L3	26	33	36.5	55	87
L4	(4)	(5)	(6.5)	(10)	(7)
L5	26	(34)	(42)	(59)	86
L6	88	(115.5)	(147)	(193)	282
C1	ϕ42	ϕ65	ϕ91	ϕ120	ϕ160
C2	(□50)	(□60)	(□80)	(□130)	(□176)
S1	2	3	4	5	8
S2	14	22	28	40	65
S3	13.5	16	22.5	28	43
B	4	5	6	8	12
K1	-	3	6	8	10
K2	-	ϕ8	ϕ18	ϕ25	ϕ35
K3	-	9.2	21	28	38.3
K4	-	ϕ11	ϕ24	ϕ32	ϕ42
K5	-	20	30	40	52
K6	-	24	35	48	58

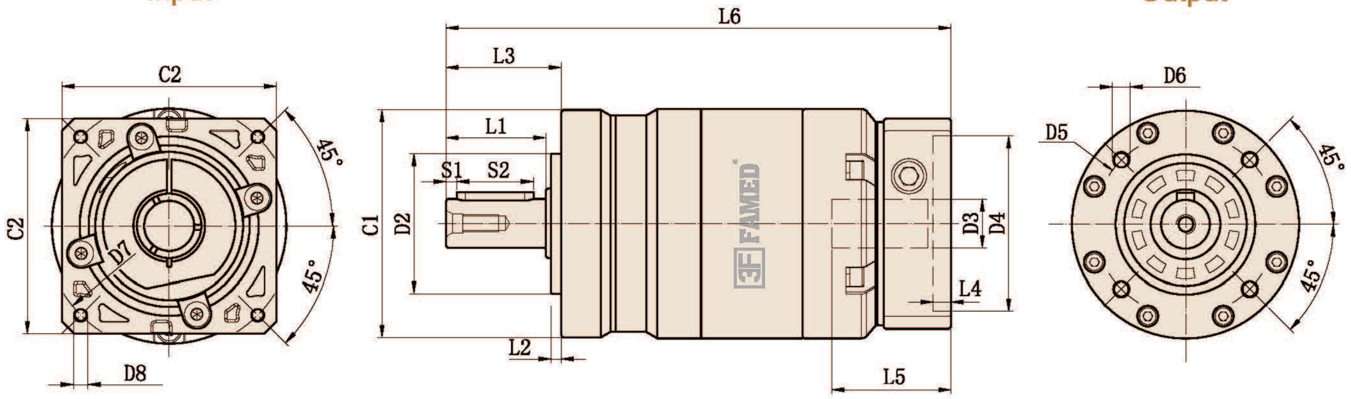
Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

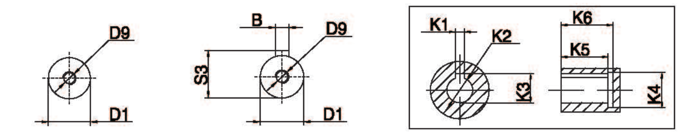
MODEL：FE

2–Stage

Ratio：12，15，16，20，25，28，30，35
40，50，70，80，100

Dimensions：





Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

Size	FE040–L2	FE060–L2	FE090–L2	FE120–L2	FE160–L2
D1	ϕ12(13)	ϕ14(16)	ϕ20(22)	ϕ25(32)	ϕ40
D2	ϕ26	ϕ40	ϕ60	ϕ80	ϕ130
D3	ϕ8(≤11)	ϕ14(≤19)	ϕ19(≤24)	ϕ24(≤32)	ϕ35(42)
D4	ϕ30(30–50)	ϕ50（50–70）	ϕ70（50–70）	ϕ110（70–130）	ϕ114.3(110–150)
D5	ϕ34	ϕ52	ϕ70	ϕ100	ϕ145
D6	4–M4	4–M5*10	4–M6*12	4–M10*20	4–M12
D7	ϕ46(45–70)	ϕ70（70–130）	ϕ90（70–130）	ϕ145（90–165）	ϕ200(145–220)
D8	(4–M4X8L)	(4–M4*10L)	(4–M5*12L)	(4–M8*20L)	(4–M12X25L)
D9	M4X0.7P	M5*0.8P*15L	M6*1.0P*16.5L	M10*1.5P*23L	M16X2.0P
L1	18	28.5	36.5	50	80
L2	2	3	3	4	5
L3	26	33	36.5	55	87
L4	(4)	(5)	(6.5)	(10)	(7)
L5	26	(34)	(42)	(59)	86
L6	104.5	(144.5)	(177.5)	(232.5)	331.5
C1	ϕ42	ϕ65	ϕ91	ϕ120	ϕ160
C2	(□50)	(□60)	(□80)	(□130)	(□176)
S1	2	3	4	5	8
S2	14	22	28	40	65
S3	13.5	16	22.5	28	43
B	4	5	6	8	12
K1	–	3	6	8	10
K2	–	ϕ8	ϕ18	ϕ25	ϕ35
K3	–	9.2	21	28	38.3
K4	–	ϕ11	ϕ24	ϕ32	ϕ42
K5	–	20	30	40	52
K6	–	24	35	48	58

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

Precision Right Angle Planetary Gearbox

FER

- 1. Space–saving
  The straight cross reducer uses spiral bevel gear. The installation of the motor can achieve 90 degree bending and save the installation space.
- 2.High rigidity & torque
  The use of integral ball bearings greatly improves the rigidity and torque.
- 3. Connector and shaft sleeve mode
  It can be installed on any motor in the world.
- 4. No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 5.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

FER Type

FER090 – 10 – S1 – P1 / Motor

Reducer Model
FER040，FER060，FER090
FER120，FER160

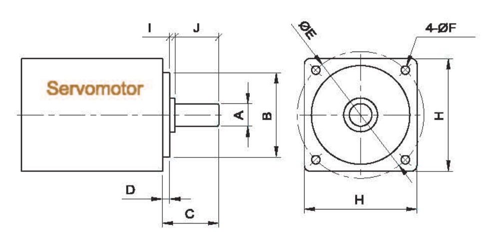
Output Shaft Keyway
S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3,4,5,6,7,8,9,10
2–stage：12,15,16,20,25,28,30,35,40,50,70,80,100
3–stage：60,64,72,80,90,100,120,144,150,160,180,200
240,258,288,320,384,512,600,800,1000

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

FER Reducer Specifications

Specs	Unit	Stage	Ratio	FER040	FER060	FER090	FER120	FER160
Rated Output Torque / T2N	Nm	1	3	20	55	130	208	342
			4	19	50	140	290	542
			5	22	60	160	330	650
			7	19	50	140	300	550
			10	14	40	100	230	450
		2	15	20	55	130	208	342
			20	19	50	145	290	542
			25	22	60	160	330	650
			30	22	55	130	208	342
			35	22	60	160	330	650
			40	22	50	140	290	542
			50	20	60	160	330	650
			70	19	50	140	300	550
			100	14	40	100	230	450
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque				
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000	2500
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤8	≤8	≤8	≤8	≤8
		2	12~100	≤10	≤10	≤10	≤10	≤10
Standard Backlash P2	arcmin	1	3~10	≤11	≤11	≤11	≤11	≤11
		2	12~100	≤13	≤13	≤13	≤13	≤13
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	22	50
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	320	460	1300	3200	6520
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	160	230	660	1600	3260
Service Life	hr	1,2	3~100	20000 h				
Efficiency / η	%	1	3~10	≥97%				
		2	15~100	≥94%				
Weight	kg	1	3~10	0.73	0.99	2.1	4.98	18.2
		2	15~100	1.05	1.46	3.2	6.92	24.9
Operating Temperature	℃	1,2	3~100	-25℃~+90℃				
Lubrication		1,2	3~100	Synthetic Grease				
Protection Class		1,2	3~100	IP65				
Mounting Position		1,2	3~100	Any Direction				
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤67	≤68

Reducer Rotary Inertia

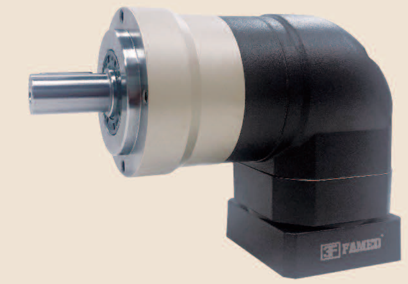
Specs	Unit	Stage	Ratio	FER040	FER060	FER090	FER120	FER160
Moment of Inertia	kg.cm^2	1	3	0.03	0.16	0.61	3.25	9.21
			4	0.03	0.14	0.48	2.74	7.54
			5	0.03	0.13	0.47	2.71	7.42
			7	0.03	0.13	0.45	2.65	7.25
			10	0.03	0.13	0.45	2.62	7.14
		2	12-40	0.03	0.13	0.44	2.58	7.07
			50-100	0.03	0.13	0.44	2.57	7.04

1. The Max. acceleration torque T2B=60% of T2NOT 2. When output speed is 100rpm, acting on the output shaft center position.
3. 3-stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

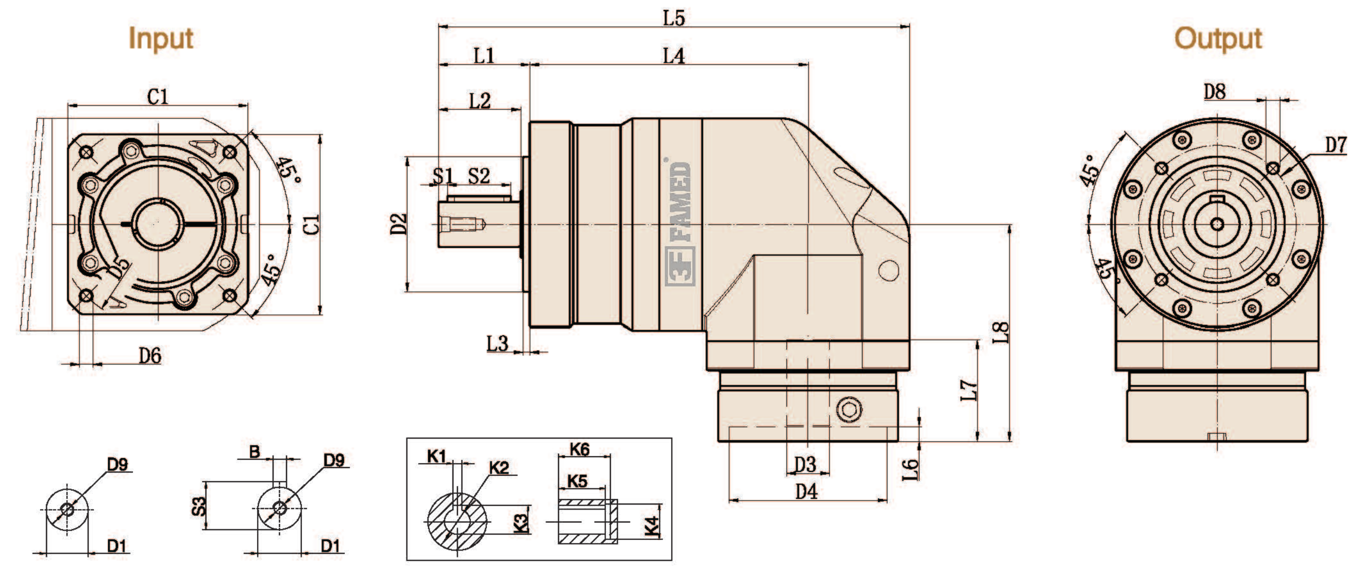
MODEL: FER

1-Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10



Dimensions:



Output shaft type S1   Output shaft type S2   Output hole type S3

Unit:mm

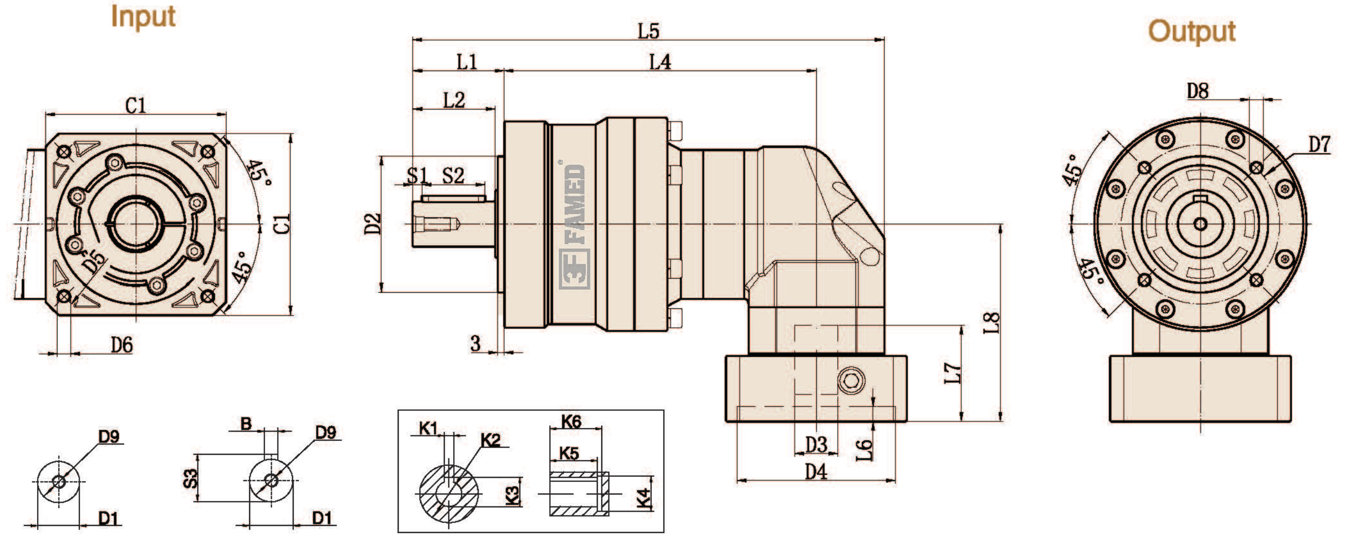
Size	FER060-L1	FER090-L1	FER120-L1	FER160-L1
D1	ϕ14(16)	ϕ20(22)	ϕ25(32)	ϕ40
D2	ϕ40	ϕ60	ϕ80	ϕ130
D3	ϕ14(6.35-19)	ϕ19(11-24)	ϕ22(16-24)	ϕ35 (ϕ22-38)
D4	ϕ50 (30-70)	ϕ70 (50-110)	ϕ110 (50-110)	ϕ114.3 (ϕ110-114.3)
D5	ϕ70(45-90)	ϕ90 (70-145)	ϕ145 (90-155)	ϕ200 (ϕ145-200)
D6	(4-M5*12L)	(4-M6*14L)	(4-M8*20L)	4-M12 (M8-M12)
D7	ϕ52	ϕ70	ϕ100	ϕ145
D8	4-M5*10L	4-M6*12L	4-M8*20L	4-M12X24L
D9	M5*0.8P*15L	M6*1.0P*16.5L	M10*1.5P*23L	M16X2P
L1	33	40.5	55	87
L2	28.5	36.5	50	80
L3	3	3	4	5
L4	90	123.5	146.5	111
L5	153	209	259	295
L6	(5)	6.5	(10)	5 (5-7)
L7	(33)	(45)	(64)	86 (62-86)
L8	(77.5)	(96)	(135.5)	165.5 (165.5-189.5)
C1	(□60)	(□80)	(□130)	175 (142)
S1	3	4	5	5
S2	22	28	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	4	6	8	10
K2	ϕ11	ϕ22	ϕ28	ϕ38
K3	12.8	24.5	31.3	41.3
K4	ϕ16	ϕ32	ϕ38	ϕ48
K5	15	20	27	35
K6	18	24	32	40

MODEL：FER

2–Stage

Ratio：12，15，16，20，25，28，30，35
40，50，70，80，100

Dimensions：



Output shaft type S1　Output shaft type S2　Output hole type S3

Unit:mm

Size	FER060–L2	FER090–L2	FER120–L2	FER160–L2
D1	ϕ14(16)	ϕ20(22)	ϕ25(32)	ϕ40
D2	ϕ40	ϕ60	ϕ80	ϕ130
D3	ϕ14(6.35–19)	ϕ19(11–24)	ϕ22(16–24)	ϕ35（ϕ22–38）
D4	ϕ50（30–70）	ϕ70（50–110）	ϕ110（50–110）	ϕ114.3（ϕ110–114.3）
D5	ϕ70(45–90)	ϕ90（70–145）	ϕ145（90–155）	ϕ200（ϕ145–200）
D6	（4–M5*12L)	（4–M6*14L)	（4–M8*20L)	4–M12（M8–M12）
D7	ϕ52	ϕ70	ϕ100	ϕ145
D8	4–M5*10L	4–M6*12L	4–M8*20L	4–M12X24L
D9	M5*0.8P*15L	M6*1.0P*16.5L	M10*1.5P*23L	M16X2P
L1	33	40.5	55	87
L2	28.5	36.5	50	80
L3	3	3	4	5
L4	119	138	176.5	149
L5	182	208.5	276.5	333
L6	(5)	6.5	(10)	5（5–7）
L7	(33)	(42.5)	(59)	86（62–86）
L8	(77.5)	(87)	(120)	165.5（165.5–189.5）
C1	（□60）	（□80)	（□130)	175（142）
S1	3	4	5	5
S2	22	28	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	4	6	8	10
K2	ϕ11	ϕ22	ϕ28	ϕ38
K3	12.8	24.5	31.3	41.3
K4	ϕ16	ϕ32	ϕ38	ϕ48
K5	15	20	27	35
K6	18	24	32	40

Standard Type Planetary Gearbox

PLF

- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 3.Methods of flange and connector
  It can be installed on any motor in the world.
- 4.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 5.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

PLF Type

PLF080 – 10 – S1 – P1 / Motor

Reducer Model

PLF040，PLF060，PLF080，PLF090
PLF120，PLF160

Output Shaft Keyway

S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model

Motor Manufacturer & Model

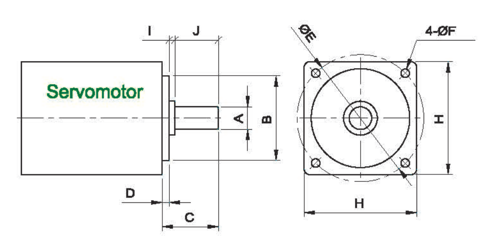
Ratio

1–stage：3,4,5,6,7,8,9,10
2–stage：12,15,16,20,25,28,30,35,40,50,70,80,100
3–stage：60,64,72,80,90,100,120,144,150,160,180,200
240,258,288,320,384,512,600,800,1000

Backlash Grade

P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type	Model	Ratio	Output Shaft Keyway	Backlash Class	MOTOR NO.

PLF Reducer Specifications

Specs	Unit	Stage	Ratio	PLF040	PLF060	PLF080	PLF090	PLF120	PLF160
Rated Output Torque / T2N	Nm	1	3	14	28	105	113	120	323
			4	15	38	108	115	215	364
			5	17	40	112	118	230	423
			7	13	35	105	110	160	358
			10	10	15	50	56	110	293
		2	15	14	28	105	113	120	323
			20	15	38	108	120	240	364
			25	17	40	112	118	250	423
			30	13	28	105	113	120	323
			35	17	35	112	118	240	358
			40	12	38	110	115	236	364
			50	15	40	108	118	230	423
			70	13	35	105	110	210	358
			100	12	31	50	56	210	293
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque					
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000	3000	2500
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤6	≤6	≤6	≤6	≤6	≤6
		2	12~100	≤8	≤8	≤8	≤8	≤8	≤8
Standard Backlash P2	arcmin	1	3~10	≤7	≤7	≤7	≤7	≤7	≤7
		2	12~100	≤10	≤10	≤10	≤10	≤10	≤10
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	12	22	50
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	320	460	1300	1300	3200	6520
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	160	230	660	660	1600	3260
Service Life	hr	1,2	3~100	20000 h					
Efficiency / η	%	1	3~10	≥97%					
		2	15~100	≥94%					
Weight	kg	1	3~10	0.73	0.99	2.1	2.5	4.98	18.2
		2	15~100	1.05	1.46	3.2	3.5	6.92	24.9
Operating Temperature	℃	1,2	3~100	-25℃~+90℃					
Lubrication		1,2	3~100	Synthetic Grease					
Protection Class		1,2	3~100	IP65					
Mounting Position		1,2	3~100	Any Direction					
Noise Level (n1=3000rpm，No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤65	≤67	≤68

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	PLF040	PLF060	PLF080	PLF090	PLF120	PLF160
Moment of Inertia	kg.cm²	1	3	0.03	0.16	0.61	0.61	3.25	9.21
			4	0.03	0.14	0.48	0.48	2.74	7.54
			5	0.03	0.13	0.47	0.47	2.71	7.42
			7	0.03	0.13	0.45	0.45	2.65	7.25
			10	0.03	0.13	0.45	0.45	2.62	7.14
		2	12-40	0.03	0.13	0.44	0.44	2.58	7.07
			50-100	0.03	0.13	0.44	0.44	2.57	7.04

1. Ratio (i=Nin/Nout)   2. Output revolutions 100rpm, acting on the output shaft center position.
3. *Continuous operation, service life is 10000hrs.

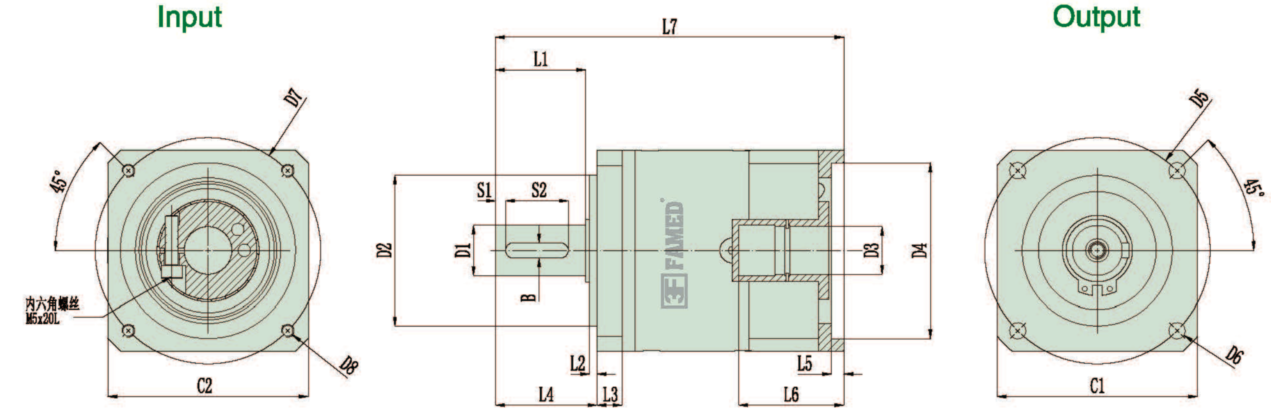
MODEL：PLF

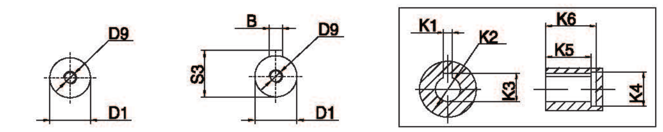
1-Stage

Ratio：3，4，5，6，7，8，9，10

Dimensions：

Input   Output





Output shaft type S1   Output shaft type S2   Output hole type S3

Unit:mm

Size	PLF040-L1	PLF060-L1	PLF080-L1	PLF090-L1	PLF120-L1	PLF160-L1
D1	ϕ10	ϕ14	ϕ20	ϕ20	ϕ25	ϕ40
D2	ϕ35	ϕ50	ϕ80	ϕ80	ϕ110	ϕ130
D3	ϕ8 (≤8)	ϕ14 (≤19)	ϕ19 (≤19)	ϕ19 (≤22)	ϕ22 (≤24)	ϕ35 (≤35)
D4	ϕ30 (30-50)	ϕ50 (50-70)	ϕ70 (50-110)	ϕ70 (50-110)	ϕ110 (70-130)	ϕ114.3 (110-150)
D5	ϕ50	ϕ70	ϕ100	ϕ100	ϕ130	ϕ185
D6	4-ϕ3.5	4-ϕ5.5	4-ϕ6.5	4-ϕ6.5	4-ϕ8.5	4-ϕ11
D7	ϕ46 (45-70)	ϕ70 (70-130)	ϕ90 (70-145)	ϕ90 (70-145)	ϕ145 (90-165)	ϕ200 (145-220)
D8	(4-M4*12L)	(4-M4*8L)	(4-M6*10L)	(4-M6*10L)	(4-M8*16L)	(4-M12*20L)
D9	M3*9L	M5*18L	M6*18L	M6*18L	M10*25L	M16*36L
L1	23	30	36	36	50	80
L2	2	3	3	3	4	5
L3	5	11	10	10	18	20
L4	26	35	40.5	40.5	55.5	87
L5	(3.5)	(4)	(5)	(6)	(10)	(10)
L6	(27)	(31)	(42)	(47)	(62.5)	(81)
L7	(88)	(115)	(139)	(150)	(210)	(276)
C1	□42	□60	□90	□90	□120	□165
C2	(□42)	(□60)	(□80)	(□90)	(□120)	(□176)
S1	2	3	3	3	5	5
S2	16	20	25	25	40	65
S3	11.2	16	22.5	22.5	28	43
B	3	5	6	6	8	12
K1	-	3	5	5	6	10
K2	-	ϕ10	ϕ15	ϕ15	ϕ20	ϕ35
K3	-	11.4	17.3	17.3	22.8	38.3
K4	-	20	30	30	38	58
K5	-	15	20	20	27	35
K6	-	18	24	24	32	40

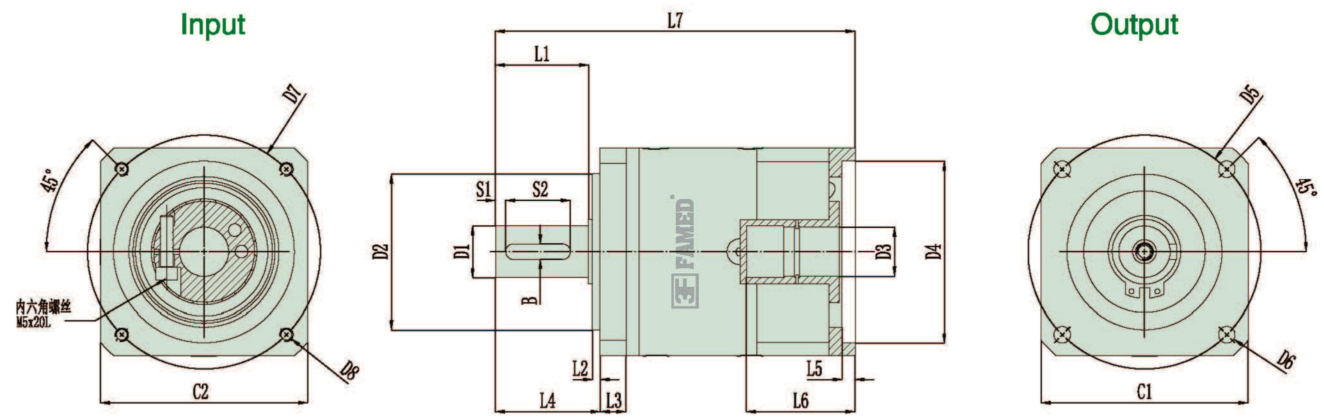
Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

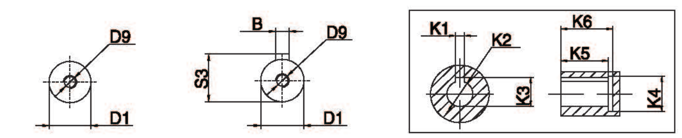
MODEL：PLF

2–Stage

Ratio：12，15，16，20，25，28，30，35
40，50，70，80，100

Dimensions：





Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

Size	PLF040–L2	PLF060–L2	PLF080–L2	PLF090–L2	PLF120–L2	PLF160–L2
D1	ϕ10	ϕ14	ϕ20	ϕ20	ϕ25	ϕ40
D2	ϕ35	ϕ50	ϕ80	ϕ80	ϕ110	ϕ130
D3	ϕ8 (≤8)	ϕ14 (≤19)	ϕ19 (≤19)	ϕ19 (≤22)	ϕ22 (≤24)	ϕ35 (≤35)
D4	ϕ30 (30–50)	ϕ50 (50–70)	ϕ70 (50–110)	ϕ70 (50–110)	ϕ110 (70–130)	ϕ114.3 (110–150)
D5	ϕ50	ϕ70	ϕ100	ϕ100	ϕ130	ϕ185
D6	4–ϕ3.5	4–ϕ5.5	4–ϕ6.5	4–ϕ6.5	4–ϕ8.5	4–ϕ11
D7	ϕ46 (45–70)	ϕ70 (70–130)	ϕ90 (70–145)	ϕ90 (70–145)	ϕ145 (90–165)	ϕ200 (145–220)
D8	(4–M4*12L)	(4–M4*8L)	(4–M6*10L)	(4–M6*10L)	(4–M8*16L)	(4–M12*20L)
D9	M3*9L	M5*18L	M6*18L	M6*18L	M10*25L	M16*36L
L1	23	30	36	36	50	80
L2	2	3	3	3	4	5
L3	5	11	10	10	18	20
L4	26	35	40.5	40.5	55.5	87
L5	(3.5)	(4)	(5)	(6)	(10)	(10)
L6	(27)	(31)	(42)	(47)	(62.5)	(81)
L7	(103)	(133)	(159)	(170)	(240)	(317)
C1	□42	□60	□90	□90	□120	□165
C2	(□42)	(□60)	(□80)	(□90)	(□120)	(□176)
S1	2	3	3	3	5	5
S2	16	20	25	25	40	65
S3	11.2	16	22.5	22.5	28	43
B	3	5	6	6	8	12
K1	–	3	5	5	6	10
K2	–	ϕ10	ϕ15	ϕ15	ϕ20	ϕ35
K3	–	11.4	17.3	17.3	22.8	38.3
K4	–	20	30	30	38	58
K5	–	15	20	20	27	35
K6	–	18	24	24	32	40

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

Standard Type Right Angle Planetary Gearbox

PFR

- 1. Space–saving
  The straight cross reducer uses spiral bevel gear. The installation of the motor can achieve 90 degree bending and save the installation space.
- 2.High rigidity & torque
  The use of integral ball bearings greatly improves the rigidity and torque.
- 3. Connector and shaft sleeve mode
  It can be installed on any motor in the world.
- 4. No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 5.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

PFR Type

PFR090 – 10 – S1 – P1 / Motor

Reducer Model
PFR040，PFR060，PFR090
PFR120，PFR160

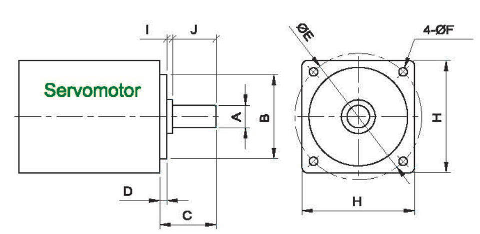
Output Shaft Keyway
S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3,4,5,6,7,8,9,10
2–stage：12,15,16,20,25,28,30,35,40,50,70,80,100
3–stage：60,64,72,80,90,100,120,144,150,160,180,200
240,258,288,320,384,512,600,800,1000

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type — Model — Ratio Output Shaft Keyway — Backlash Class — MOTOR NO.

PFR Reducer Specifications

Specs	Unit	Stage	Ratio	PFR040	PFR060	PFR090	PFR120	PFR160
Rated Output Torque / T2N	Nm	1	3	14	28	113	161	323
			4	15	38	115	210	364
			5	17	40	118	210	423
			7	13	35	110	170	358
			10	12	16	56	86	293
		2	15	14	28	113	161	323
			20	15	38	120	210	364
			25	17	40	118	210	423
			30	13	28	113	210	323
			35	17	35	118	210	358
			40	12	38	115	210	364
			50	15	40	118	210	423
			70	13	35	110	170	358
			100	12	16	56	86	293
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque				
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000	2500
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤10	≤10	≤10	≤10	≤10
		2	12~100	≤12	≤12	≤12	≤12	≤12
Standard Backlash P2	arcmin	1	3~10	≤12	≤12	≤12	≤12	≤12
		2	12~100	≤14	≤14	≤14	≤14	≤14
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	22	50
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	320	460	1300	3200	6520
Max.Axial Force / F_{2aB}[2]	N	1,2	3~100	160	230	660	1600	3260
Service Life	hr	1,2	3~100	20000 h				
Efficiency / η	%	1	3~10	≥97%				
		2	15~100	≥94%				
Weight	kg	1	3~10	0.73	0.99	2.1	4.98	18.2
		2	15~100	1.05	1.46	3.2	6.92	24.9
Operating Temperature	℃	1,2	3~100	-25℃~+90℃				
Lubrication		1,2	3~100	Synthetic Grease				
Protection Class		1,2	3~100	IP65				
Mounting Position		1,2	3~100	Any Direction				
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤67	≤68

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	PFR040	PFR060	PFR090	PFR120	PFR160
Moment of Inertia	kg.cm²	1	3	0.03	0.16	0.61	3.25	9.21
			4	0.03	0.14	0.48	2.74	7.54
			5	0.03	0.13	0.47	2.71	7.42
			7	0.03	0.13	0.45	2.65	7.25
			10	0.03	0.13	0.45	2.62	7.14
		2	12–40	0.03	0.13	0.44	2.58	7.07
			50–100	0.03	0.13	0.44	2.57	7.04

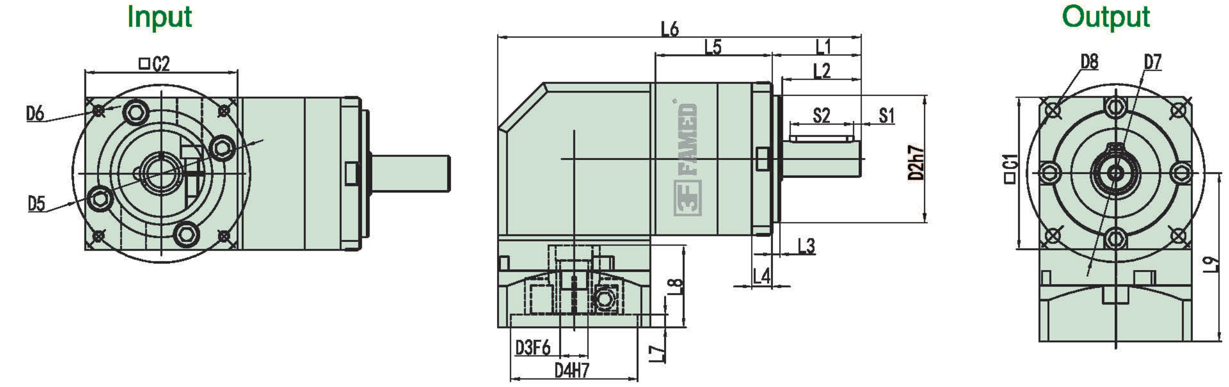
1. The Max. acceleration torque T2B=60% 2.When output speed is 100rpm, acting on the output shaft center position
3. 3-stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

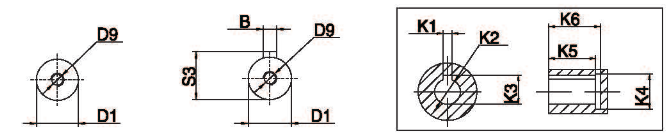
MODEL: PFR

1-Stage

Ratio: 3, 4 , 5, 6, 7, 8, 9, 10

Dimensions:





Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

Size	PFR060-L1	PFR080-L1	PFR120-L1	PFR160-L1
D1	ϕ14(16)	ϕ20 (22)	ϕ25 (32)	ϕ40
D2	ϕ50	ϕ80	ϕ110	ϕ130
D3	ϕ14 (ϕ6.35–19)	ϕ19 (ϕ11–24)	ϕ22 (ϕ16–24)	ϕ35 (ϕ22–38)
D4	ϕ50 (ϕ30–70)	ϕ70 (ϕ50–110)	ϕ110 (ϕ55.5–110)	ϕ114.3 (ϕ110–114.3)
D5	ϕ70 (ϕ45–90)	ϕ90 (ϕ70–145)	ϕ145 (ϕ90–155)	ϕ200 (ϕ145–200)
D6	4-M4 (M3-M6)	4-M5 (M4-M8)	4-M8 (M6-M12)	4-M12 (M8-M12)
D7	ϕ70	ϕ100	ϕ130	ϕ185
D8	4-ϕ5.5	4-ϕ6.5	4-ϕ8.5	4-ϕ11
D9	M5X0.8P	M8X1.25P	M10X1.5P	M16X2P
L1	35	40	55	87
L2	31	35	49	78
L3	3	3	4	5
L4	8	12	15	20
L5	46	55	80	111
L6	143	190	273	295
L7	5(4–6)	8(5–8)	8(5–8)	5 (5–7)
L8	32(32–44)	42(42–60)	70 (59–70)	86 (62–86)
L9	66(66–88)	95.5(95.5–113.5)	130 (119–130)	165.5 (165.5–189.5)
C1	60	90	120	160
C2	60(60–90)	90(90–130)	130 (120)	175 (142)
S1	3	3	5	5
S2	25	30	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	4	6	8	10
K2	ϕ11	ϕ22	ϕ28	ϕ38
K3	12.8	24.5	31.3	41.3
K4	ϕ16	ϕ32	ϕ38	ϕ48
K5	15	20	27	35
K6	18	24	32	40

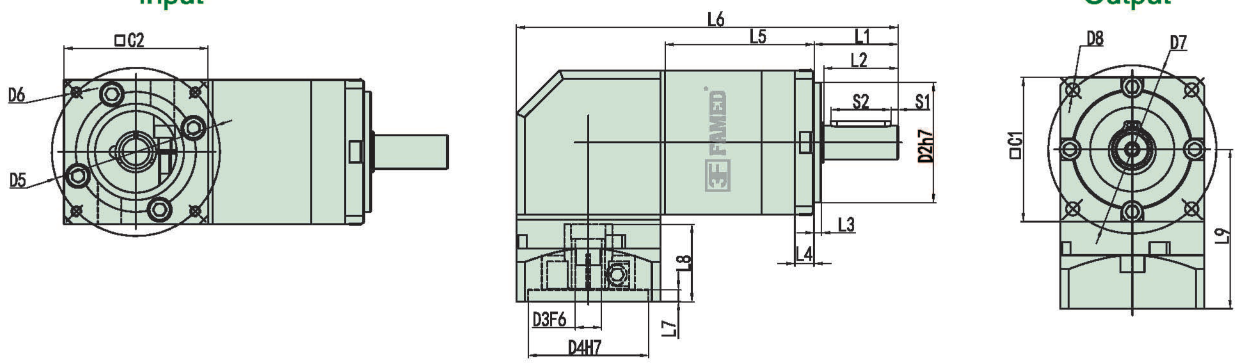
MODEL：PFR

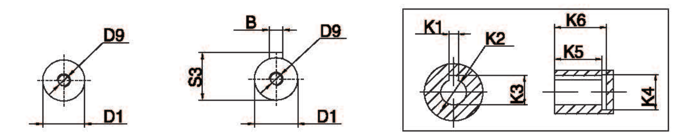
2–Stage

Ratio：12，15，16，20，25，28，30，35
40，50，70，80，100

Dimensions：

Input　　　　　　　　　　Output





Output shaft type S1　　Output shaft type S2　　Output hole type S3

Unit:mm

Size	PFR060–L2	PFR080–L2	PFR120–L2	PFR160–L2
D1	ϕ14(16)	ϕ20（22）	ϕ25（32）	ϕ40
D2	ϕ50	ϕ80	ϕ110	ϕ130
D3	ϕ14（ϕ6.35–19）	ϕ19（ϕ11–24）	ϕ22（ϕ16–24）	ϕ35（ϕ22–38）
D4	ϕ50（ϕ30–70）	ϕ70（ϕ50–110）	ϕ110（ϕ55.5–110）	ϕ114.3（ϕ110–114.3）
D5	ϕ70（ϕ45–90）	ϕ90（ϕ70–145）	ϕ145（ϕ90–155）	ϕ200（ϕ145–200）
D6	4–M4（M3–M6）	4–M5（M4–M8）	4–M8（M6–M12）	4–M12（M8–M12）
D7	ϕ70	ϕ100	ϕ130	ϕ185
D8	4–ϕ5.5	4–ϕ6.5	4–ϕ8.5	4–ϕ11
D9	M5X0.8P	M8X1.25P	M10X1.5P	M16X2P
L1	35	40	55	87
L2	31	35	49	78
L3	3	3	4	5
L4	8	12	15	20
L5	62	78.5	110	149
L6	159	213.5	303	333
L7	5(4–6)	8(5–8)	8(5–8)	5（5–7）
L8	32(32–44)	42(42–60)	70（59–70）	86（62–86）
L9	66(66–88)	95.5(95.5–113.5)	130（119–130）	165.5（165.5–189.5）
C1	60	90	120	160
C2	60(60–90)	90(90–130)	130（120）	175（142）
S1	3	3	5	5
S2	25	30	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	4	6	8	10
K2	ϕ11	ϕ22	ϕ28	ϕ38
K3	12.8	24.5	31.3	41.3
K4	ϕ16	ϕ32	ϕ38	ϕ48
K5	15	20	27	35
K6	18	24	32	40

Standard Type Planetary Gearbox

PLE

- 1.Quiet operation
  Helical gears are used to achieve smooth and quiet operation.
- 2.High rigidity & torqueThe use of integral ball bearings greatly improves the rigidity and torque.
- 3.Methods of flange and connector
  It can be installed on any motor in the world.
- 4.No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 5.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

PLE Type

PLE080 – 10 – S1 – P1 / Motor

Reducer Model

PLE040，PLE060，PLE080，PLE090
PLE120，PLE160

Output Shaft Keyway

S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model

Motor Manufacturer & Model

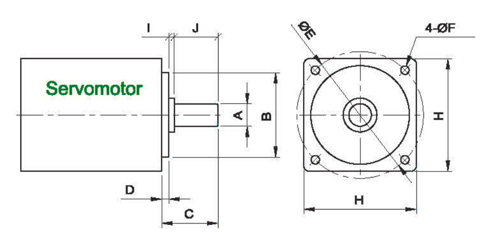
Ratio

1–stage：3,4,5,6,7,8,9,10
2–stage：12,15,16,20,25,28,30,35,40,50,70,80,100
3–stage：60,64,72,80,90,100,120,144,150,160,180,200
240,258,288,320,384,512,600,800,1000

Backlash Grade

P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type — Model — Ratio — Output Shaft Keyway — Backlash Class — MOTOR NO.

PLE Reducer Specifications

Specs	Unit	Stage	Ratio	PLE040	PLE060	PLE080	PLE090	PLE120	PLE160
Rated Output Torque / T2N	Nm	1	3	14	28	105	113	120	323
			4	15	38	108	115	215	364
			5	17	40	112	118	230	423
			7	13	35	105	110	160	358
			10	10	15	50	56	110	293
		2	15	14	28	105	113	120	323
			20	15	38	108	120	240	364
			25	17	40	112	118	250	423
			30	13	28	105	113	120	323
			35	17	35	112	118	240	358
			40	12	38	110	115	236	364
			50	15	40	108	118	230	423
			70	13	35	105	110	210	358
			100	12	31	50	56	210	293
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque					
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000	3000	2500
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤6	≤6	≤6	≤6	≤6	≤6
		2	12~100	≤8	≤8	≤8	≤8	≤8	≤8
Standard Backlash P2	arcmin	1	3~10	≤8	≤8	≤8	≤8	≤8	≤8
		2	12~100	≤10	≤10	≤10	≤10	≤10	≤10
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	12	22	50
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	320	460	1300	1300	3200	6520
Max.Axial Force / F_{2a1B}[2]	N	1,2	3~100	160	230	660	660	1600	3260
Service Life	hr	1,2	3~100	20000 h					
Efficiency / η	%	1	3~10	≥97%					
		2	15~100	≥94%					
Weight	kg	1	3~10	0.73	0.99	2.1	2.4	4.98	18.2
		2	15~100	1.05	1.46	3.2	3.6	6.92	24.9
Operating Temperature	℃	1,2	3~100	-25℃~+90℃					
Lubrication		1,2	3~100	Synthetic Grease					
Protection Class		1,2	3~100	IP65					
Mounting Position		1,2	3~100	Any Direction					
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤65	≤67	≤68

Reducer Rotary Inertia

Specs	Unit	Stage	Ratio	PLE040	PLE060	PLE080	PLE090	PLE120	PLE160
Moment of Inertia	$kg.cm^2$	1	3	0.03	0.16	0.61	0.61	3.25	9.21
			4	0.03	0.14	0.48	0.48	2.74	7.54
			5	0.03	0.13	0.47	0.47	2.71	7.42
			7	0.03	0.13	0.45	0.45	2.65	7.25
			10	0.03	0.13	0.45	0.45	2.62	7.14
		2	12-40	0.03	0.13	0.44	0.44	2.58	7.07
			50-100	0.03	0.13	0.44	0.44	2.57	7.04

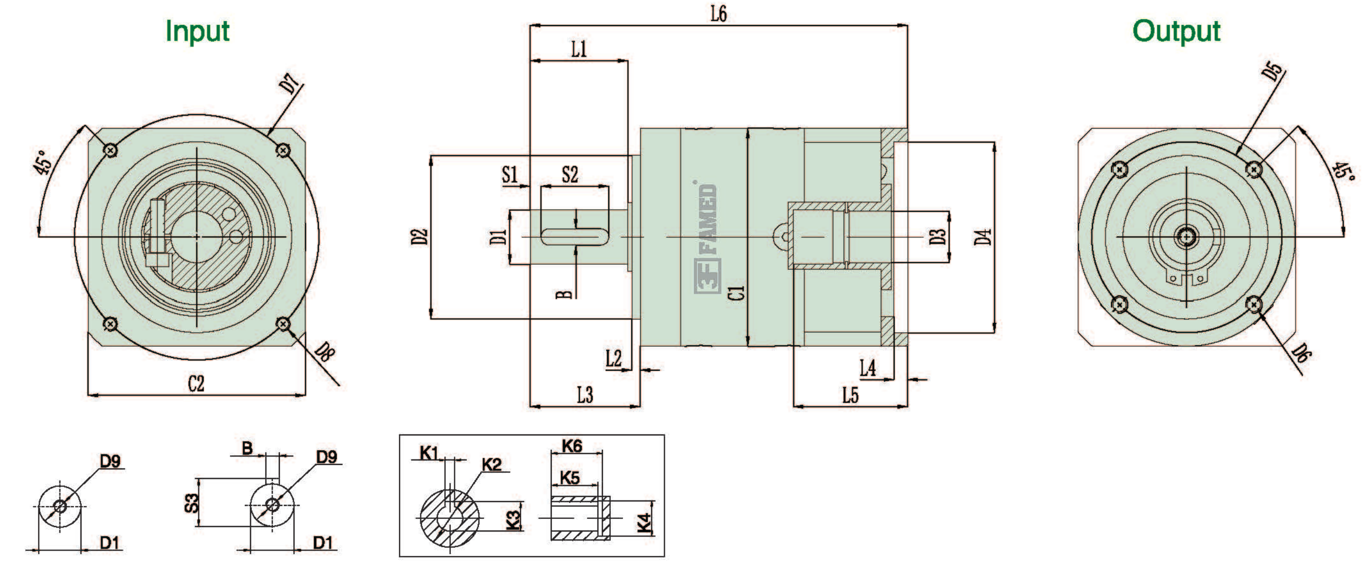
1. Ratio (i=Nin/Nout) 2. Output revolutions 100rpm, acting on the output shaft center position.
3. *Continuous operation, service life is 10000hrs.

MODEL: PLE

1-Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10

Dimensions:



Output shaft type S1 Output shaft type S2 Output hole type S3

Unit:mm

Size	PLE040-L1	PLE060-L1	PLE080-L1	PLE090-L1	PLE120-L1	PLE160-L1
D1	ϕ10	ϕ14	ϕ20	ϕ20	ϕ25	ϕ40
D2	ϕ26	ϕ40	ϕ60	ϕ60	ϕ80	ϕ130
D3	ϕ8 (≤8)	ϕ14 (≤14)	ϕ19 (≤19)	ϕ19 (≤24)	ϕ22 (≤24)	ϕ35 (≤35)
D4	ϕ30 (30-50)	ϕ50 (50-70)	ϕ70 (50-110)	ϕ70 (50-110)	ϕ110 (70-130)	ϕ114.3 (110-150)
D5	ϕ34	ϕ52	ϕ70	ϕ70	ϕ100	ϕ145
D6	(4-M4*8L)	(4-M5*15L)	(4-M6*12L)	(4-M6*20L)	(4-M10*18L)	(4-M12*24L)
D7	ϕ46 (45-70)	ϕ70 (70-130)	ϕ90 (70-145)	ϕ90 (70-145)	ϕ145 (90-165)	ϕ200 (145-220)
D8	(4-M4*12L)	(4-M5*10L)	(4-M6*15L)	(4-M6*15L)	(4-M8*16L)	(4-M12*20L)
D9	M3*9L	M5*16L	M6*18L	M6*18L	M10*25L	M16*30L
L1	23	30	36	36	50	80
L2	2	3	3	3	4	5
L3	26	35	40.5	40.5	55.5	87
L4	(3.5)	(4)	(5)	(6)	(10)	(10)
L5	(27)	(31)	(42)	(47)	(62.5)	(81)
L6	(88)	(115)	(139.0)	(150)	(210)	(276)
C1	ϕ42	ϕ60	ϕ80		ϕ120	ϕ165
C2	(□42)	(□60)	(□80)	(□90)	(□120)	(□176)
S1	2	3	4	3	5	5
S2	16	20	25	25	40	65
S3	11.2	16	22.5	22.5	28	43
B	3	5	6	6	8	12
K1	-	3	5	5	6	10
K2	-	ϕ10	ϕ15	ϕ15	ϕ20	ϕ35
K3	-	11.4	17.3	17.3	22.8	38.3
K4	-	20	30	30	38	58
K5	-	15	20	20	27	35
K6	-	18	24	24	32	40

Note 1: Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

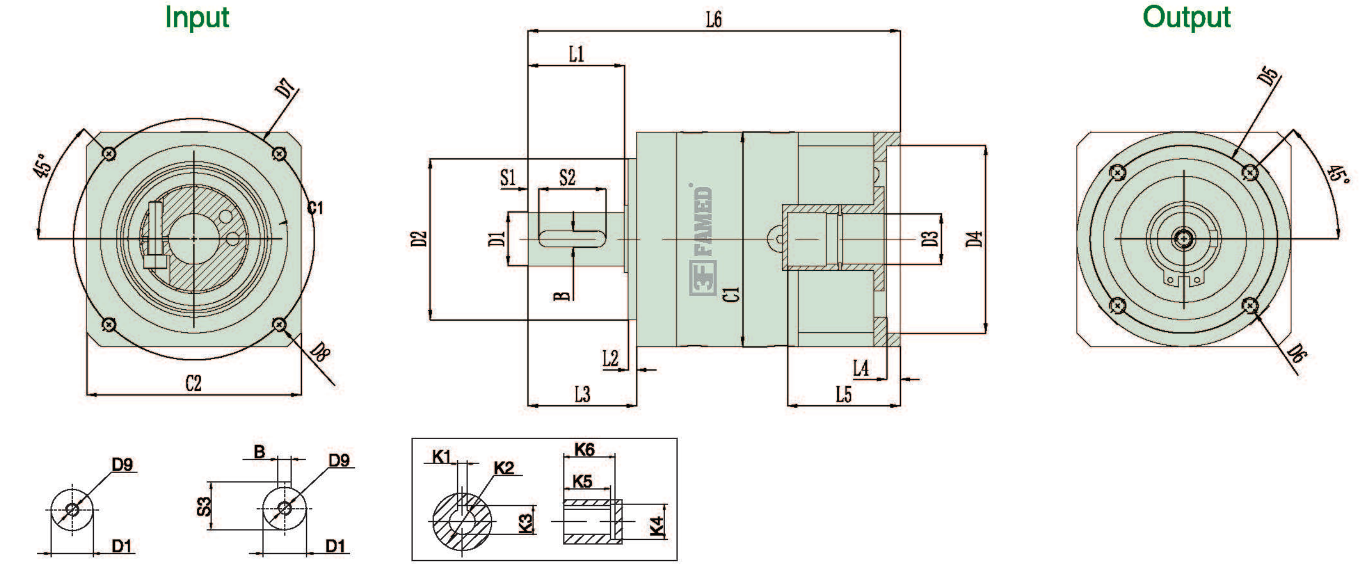
MODEL：PLE

2–Stage

Ratio：12，15，16，20，25，28，30，35
40，50，70，80，100

Dimensions：

Input Output



Output shaft type S1 Output shaft type S2 Output hole type S3

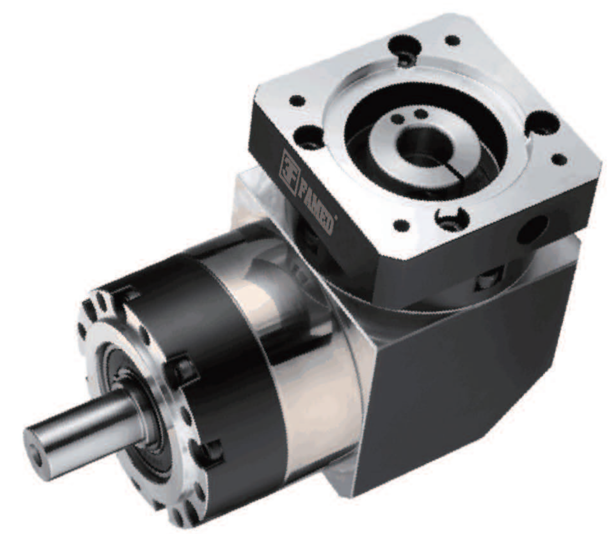
Unit:mm

Size	PLE040–L2	PLE060–L2	PLE080–L2	PLE090–L2	PLE120–L2	PLE160–L2
D1	ϕ10	ϕ14	ϕ20	ϕ20	ϕ25	ϕ40
D2	ϕ26	ϕ40	ϕ60	ϕ60	ϕ80	ϕ130
D3	ϕ8 (≤8)	ϕ14 (≤14)	ϕ19 (≤19)	ϕ19 (≤24)	ϕ22 (≤24)	ϕ35 (≤35)
D4	ϕ30 (30–50)	ϕ50 (50–70)	ϕ70 (50–110)	ϕ70 (50–110)	ϕ110 (70–130)	ϕ114.3 (110–150)
D5	ϕ34	ϕ52	ϕ70	ϕ70	ϕ100	ϕ145
D6	(4–M4*8L)	(4–M5*15L)	(4–M6*12L)	(4–M6*20L)	(4–M10*18L)	(4–M12*24L)
D7	ϕ46 (45–70)	ϕ70 (70–130)	ϕ90 (70–145)	ϕ90 (70–145)	ϕ145 (90–165)	ϕ200 (145–220)
D8	(4–M4*12L)	(4–M5*10L)	(4–M6*15L)	(4–M6*15L)	(4–M8*16L)	(4–M12*20L)
D9	M3*9L	M5*16L	M6*18L	M6*18L	M10*25L	M16*30L
L1	23	30	36	36	50	80
L2	2	3	3	3	4	5
L3	26	35	40.5	40.5	55.5	87
L4	(3.5)	(4)	(5)	(6)	(10)	(10)
L5	(27)	(31)	(42)	(47)	(62.5)	(81)
L6	(103)	(133)	(159.0)	(170)	(239.5)	(317)
C1	ϕ42	ϕ60	ϕ80		ϕ120	ϕ165
C2	(□42)	(□60)	(□80)	(□90)	(□120)	(□176)
S1	2	3	4	3	5	5
S2	16	20	25	25	40	65
S3	11.2	16	22.5	22.5	28	43
B	3	5	6	6	8	12
K1	–	3	5	5	6	10
K2	–	ϕ10	ϕ15	ϕ15	ϕ20	ϕ35
K3	–	11.4	17.3	17.3	22.8	38.3
K4	–	20	30	30	38	58
K5	–	15	20	20	27	35
K6	–	18	24	24	32	40

Note 1：Inside of () is the optional range of sizes, outside of () is the standard sizes.
Note 2: The reducer output shaft size and length can be customized for customers.
Note 3: The input size can be changed according to the servomotor or stepper motor of each brand.

Standard Type Right Angle Planetary Gearbox

PER



- 1. Space–saving
  The straight cross reducer uses spiral bevel gear. The installation of the motor can achieve 90 degree bending and save the installation space.
- 2.High rigidity & torque
  The use of integral ball bearings greatly improves the rigidity and torque.
- 3. Connector and shaft sleeve mode
  It can be installed on any motor in the world.
- 4. No grease leakage
  The use of grease with high viscosity which is not easy to separate effectively prevents the grease leakage.
- 5.Convenient maintenance
  No need to replace the grease in the product life period , and the installation is more convenient.

Model Selection of Speed Reducers

PER Type

PER090 – 10 – S1 – P1 / Motor

Reducer Model
PER040，PER060，PER090
PER120，PER160

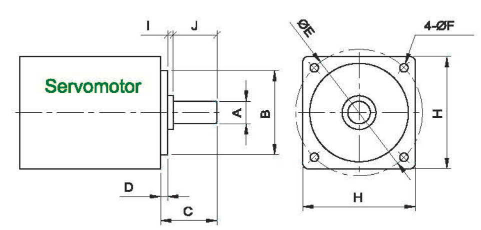
Output Shaft Keyway
S1：Solid Output Shaft No Keyway
S2：Standard (Keyway)
S3：Output for holes

Motor Model
Motor Manufacturer & Model

Ratio
1–stage：3,4,5,6,7,8,9,10
2–stage：12,15,16,20,25,28,30,35,40,50,70,80,100
3–stage：60,64,72,80,90,100,120,144,150,160,180,200
240,258,288,320,384,512,600,800,1000

Backlash Grade
P0：High precision backlash
P1：Precision backlash
P2：Standard backlash

The gearbox matching motor needs to be confirmed with following dimensions：



A	B	C	D	E	F	H	I	J

Naming Scheme:

Type – Model – Ratio – Output Shaft Keyway – Backlash Class – MOTOR NO.

PER Reducer Specifications

Specs	Unit	Stage	Ratio	PER040	PER060	PER090	PER120	PER160
Rated Output Torque / T2N	Nm	1	3	14	28	113	161	323
			4	15	38	115	210	364
			5	17	40	118	210	423
			7	13	35	110	170	358
			10	12	16	56	86	293
		2	15	14	28	113	161	323
			20	15	38	120	210	364
			25	17	40	118	210	423
			30	13	28	113	210	323
			35	17	35	118	210	358
			40	12	38	115	210	364
			50	15	40	118	210	423
			70	13	35	110	170	358
			100	12	16	56	86	293
Max.Output Torque / T_{2NOT}[1]	Nm	1,2	3~100	3Times of Nominal Output Torque				
Rated Input Speed / n_{1N}	rpm	1,2	3~100	3000	3000	3000	3000	2500
Max.Input Speed / n_{1B}	rpm	1,2	3~100	5000	5000	5000	5000	3600
Precision Backlash P1	arcmin	1	3~10	≤10	≤10	≤10	≤10	≤10
		2	12~100	≤12	≤12	≤12	≤12	≤12
Standard Backlash P2	arcmin	1	3~10	≤12	≤12	≤12	≤12	≤12
		2	12~100	≤14	≤14	≤14	≤14	≤14
Torsional Rigidity	Nm/arcmin	1,2	3~100	3	6	12	22	50
Max.Radial Force / F_{2rB}[2]	N	1,2	3~100	320	460	1300	3200	6520
Max.Axial Force / F_{2aB}[2]	N	1,2	3~100	160	230	660	1600	3260
Service Life	hr	1,2	3~100	20000 h				
Efficiency / η	%	1	3~10	≥97%				
		2	15~100	≥94%				
Weight	kg	1	3~10	0.73	0.99	2.1	4.98	18.2
		2	15~100	1.05	1.46	3.2	6.92	24.9
Operating Temperature	℃	1,2	3~100	-25℃~+90℃				
Lubrication		1,2	3~100	Synthetic Grease				
Protection Class		1,2	3~100	IP65				
Mounting Position		1,2	3~100	Any Direction				
Noise Level (n1=3000rpm, No load)	dB(A)	1,2	3~100	≤62	≤63	≤65	≤67	≤68

Reducer Rotary Inertia

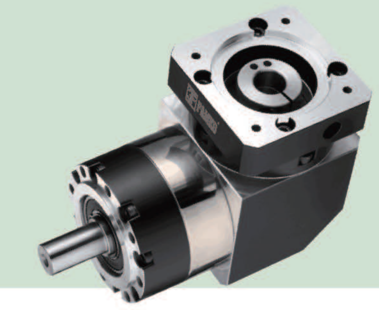
Specs	Unit	Stage	Ratio	PER040	PER060	PER090	PER120	PER160
Moment of Inertia	$kg.cm^2$	1	3	0.03	0.16	0.61	3.25	9.21
			4	0.03	0.14	0.48	2.74	7.54
			5	0.03	0.13	0.47	2.71	7.42
			7	0.03	0.13	0.45	2.65	7.25
			10	0.03	0.13	0.45	2.62	7.14
		2	12–40	0.03	0.13	0.44	2.58	7.07
			50–100	0.03	0.13	0.44	2.57	7.04

1. The Max. acceleration torque T2B=60% of T2NOT 2. When output speed is 100rpm, acting on the output shaft center position.
3. 3–stage big ratios are not in the above table. There is shaft lengthening and enlarging design. Please tell sales person if you need it.

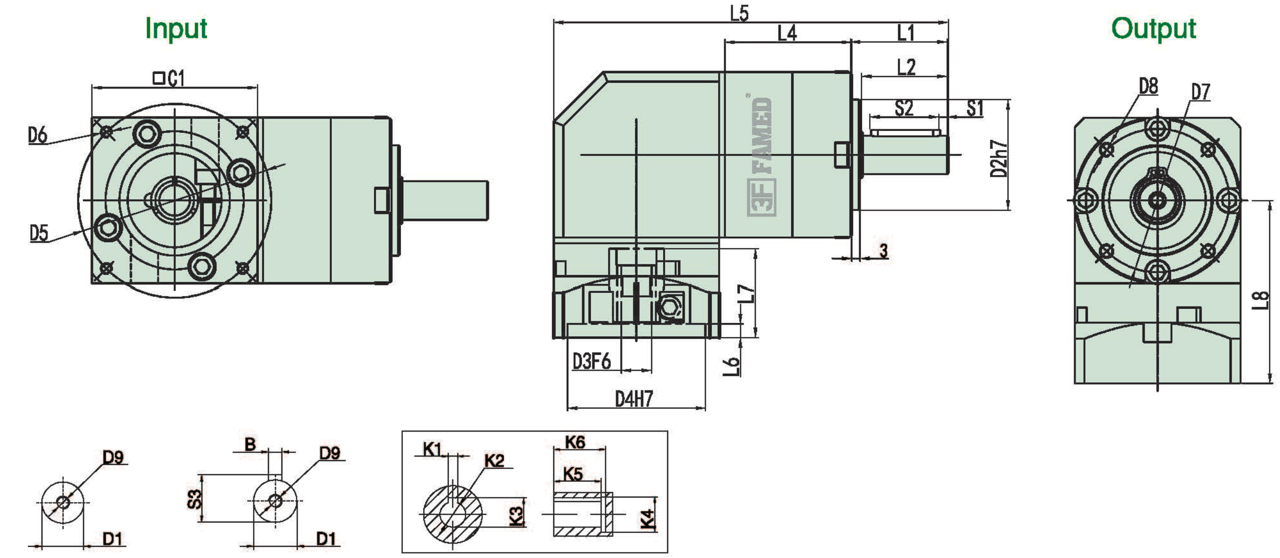
MODEL: PER

1–Stage

Ratio: 3, 4, 5, 6, 7, 8, 9, 10



Dimensions:



Output shaft type S1 Output shaft type S2 Output hole type S3

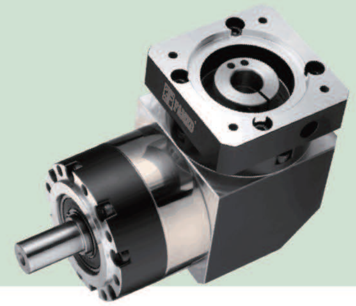
Unit:mm

Size	PER060–L1	PER090–L1	PER120–L1	PER160–L1
D1	ϕ14(16)	ϕ20 (22)	ϕ25 (32)	ϕ40
D2	ϕ40	ϕ60	ϕ80	ϕ130
D3	ϕ14 (ϕ6.35–19)	ϕ19 (ϕ11–24)	ϕ22 (ϕ16–24)	ϕ35 (ϕ22–38)
D4	ϕ50 (ϕ30–70)	ϕ70 (ϕ50–110)	ϕ110 (ϕ55.5–110)	ϕ114.3 (ϕ110–114.3)
D5	ϕ70 (ϕ45–90)	ϕ90 (ϕ70–145)	ϕ145 (ϕ90–155)	ϕ200 (ϕ145–200)
D6	4–M4 (M3–M6)	4–M5 (M4–M8)	4–M8 (M6–M12)	4–M12 (M8–M12)
D7	ϕ52	ϕ70	ϕ100	ϕ145
D8	4–M5X10L	4–M6X12L	4–M10X20L	4–M12X24L
D9	M5X0.8P	M8X1.25P	M10X1.5P	M16X2P
L1	35	40	55	87
L2	31	35	49	80
L3	3	3	4	5
L4	46	55	80	111
L5	143	190	273	295
L6	5(4–6)	8(5–8)	8(5–8)	5 (5–7)
L7	32(32–44)	42(42–60)	70 (59–70)	86 (62–86)
L8	66(66–88)	95.5(95.5–113.5)	130 (119–130)	165.5 (165.5–189.5)
C1	60(60–90)	90(90–130)	130 (120)	175 (142)
S1	3	3	5	5
S2	25	30	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	4	6	8	10
K2	ϕ11	ϕ22	ϕ28	ϕ38
K3	12.8	24.5	31.3	41.3
K4	ϕ16	ϕ32	ϕ38	ϕ48
K5	15	20	27	35
K6	18	24	32	40

MODEL：PER

2–Stage

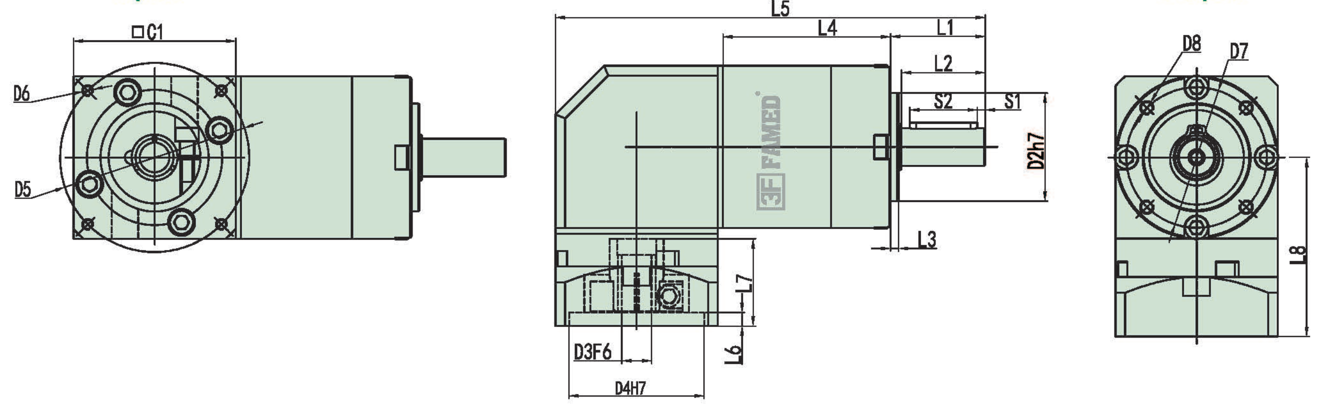
Ratio：12，15，16，20，25，28，30，35
40，50，70，80，100

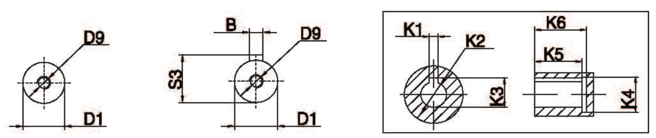


Dimensions：

Input

Output





Output shaft type S1　　Output shaft type S2　　Output hole type S3

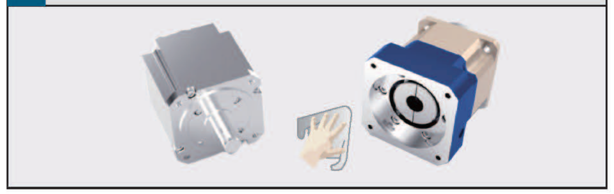
Unit:mm

Size	PER060–L2	PER090–L2	PER120–L2	PER160–L2
D1	ϕ14(16)	ϕ20（22）	ϕ25（32）	ϕ40
D2	ϕ40	ϕ60	ϕ80	ϕ130
D3	ϕ14（ϕ6.35–19）	ϕ19（ϕ11–24）	ϕ22（ϕ16–24）	ϕ35（ϕ22–38）
D4	ϕ50（ϕ30–70）	ϕ70（ϕ50–110）	ϕ110（ϕ55.5–110）	ϕ114.3（ϕ110–114.3）
D5	ϕ70（ϕ45–90）	ϕ90（ϕ70–145）	ϕ145（ϕ90–155）	ϕ200（ϕ145–200）
D6	4–M4（M3–M6）	4–M5（M4–M8）	4–M8（M6–M12）	4–M12（M8–M12）
D7	ϕ52	ϕ70	ϕ100	ϕ145
D8	4–M5X10L	4–M6X12L	4–M10X20L	4–M12X24L
D9	M5X0.8P	M8X1.25P	M10X1.5P	M16X2P
L1	35	40	55	87
L2	31	35	49	80
L3	3	3	4	5
L4	62	78.5	110	149
L5	159	213.5	303	333
L6	5(4–6)	8(5–8)	8(5–8)	5（5–7）
L7	32(32–44)	42(42–60)	70（59–70）	86（62–86）
L8	66(66–88)	95.5(95.5–113.5)	130（119–130）	165.5（165.5–189.5）
C1	60(60–90)	90(90–130)	130（120）	175（142）
S1	3	3	5	5
S2	25	30	40	70
S3	16	22.5	28	43
B	5	6	8	12
K1	4	6	8	10
K2	ϕ11	ϕ22	ϕ28	ϕ38
K3	12.8	24.5	31.3	41.3
K4	ϕ16	ϕ32	ϕ38	ϕ48
K5	15	20	27	35
K6	18	24	32	40

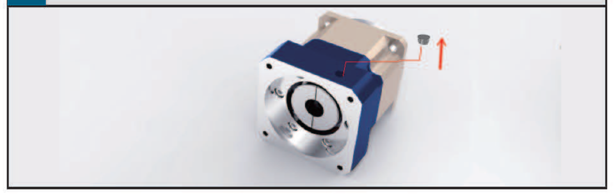
Installation

Mounting procedure to the motor

1 Wipe off anti–rust agent and oil on the motor shaft.

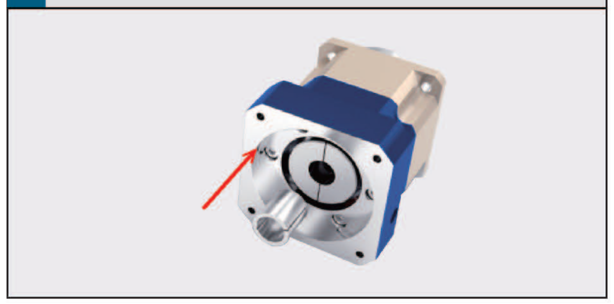


2 Remove the plug

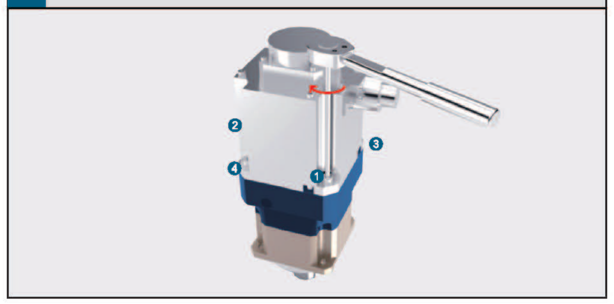


3 Turn the input shaft until the cap screw is seen. Make sure the cap screw is loosened.

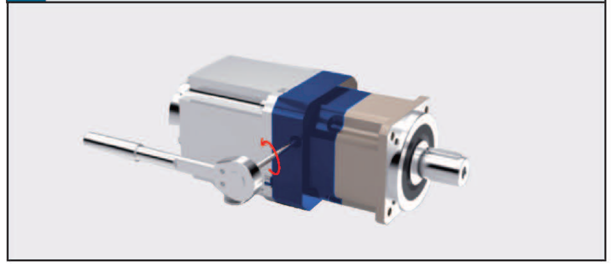
In case the bushing has been attached, Please fix it to the reducer as the drawing below.



4 Please place reducer vertically on the flat surface so the motor mounting part faces up. Carefully insert the motor shaft into the input shaft. (It should be inserted smoothly) Make sure the motor flange is perfectly fit to the reducer's flange. Tighten the motor installing bolts to the proper torque.(See table1)



5 Tighten the clamping bolt of the input shaft with torque wrench to the proper torque.(See table1)



6 Reinstall the plug. The procedure is done.

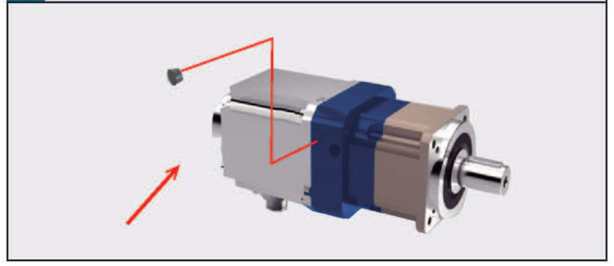


Table1

Bolt size	Retaining bolt		Clamping bolt	
	Nm	kgfm	Nm	kgfm
M3	1.1	0.11	1.9	0.18
M4	2.5	0.26	4.3	0.44
M5	5.1	0.52	8.7	0.89
M6	8.7	0.89	15	1.5
M8	21	2.1	36	3.7
M10	42	4.3	71	7.2
M12	72	7.3	125	13
M16	134	14	–	–

Table 2

Bolt size	Tightening torque	
	Nm	kgfm
M3	1.9	0.18
M4	4.3	0.44
M5	8.7	0.89
M6	15	1.5
M8	36	3.7
M10	71	7.2
M12	125	13
M16	310	32
M20	603	62

※Recommended bolt：Strength 12.9

Precision Hollow Rotary Actuator

DG

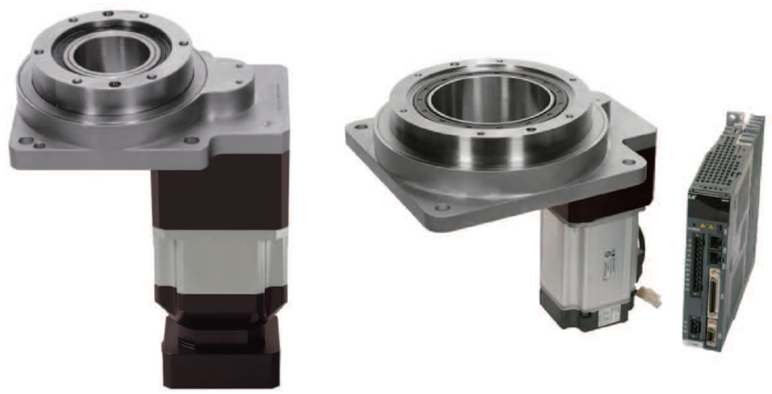
Hollow rotary transmission device with large diameter
Simple wiring and piping

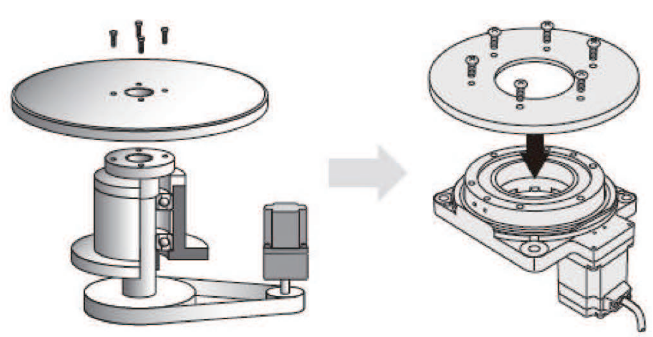
Direct connection
Simple design to improve trust

High positioning precision
The accuracy of repeated positioning is + 15sec Lost motion is 2mins
Angle transmission error is 4mins

Easy of origin regression
regression thanks to the using the origin sensor kit
(Choose and purchase accessories)

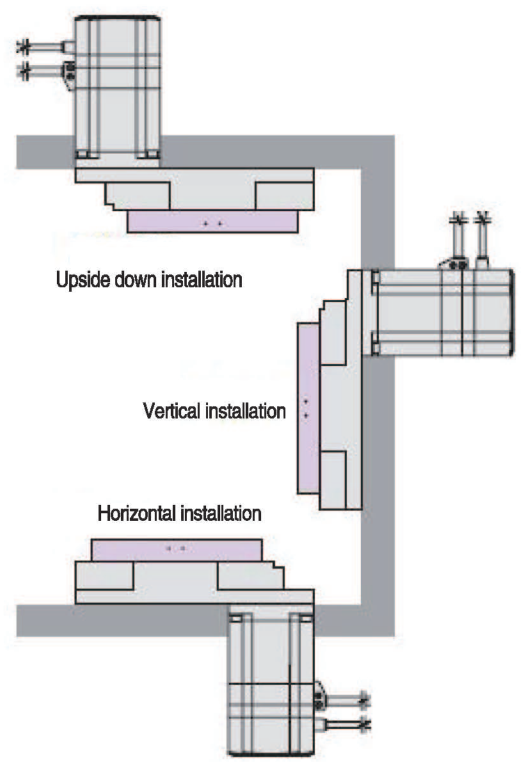
Short time positioning
The positioning of the inertial load can be realized in a short time





Motor + mechanism components
(separate design * procurement)

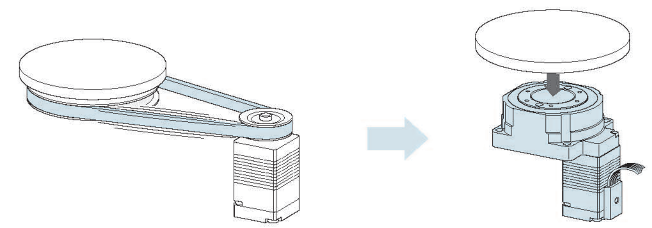
DGII series
(Integrated product)



Hollow rotary transmission device

● Direct connection→Simple design to improve trust

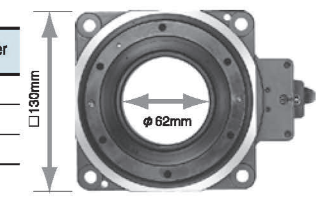
The hollow output platform can directly install the worktable and machine arm of the equipment. When the general equipment is positioned and run through the belt pulley and other parts, the precision of the transmission efficiency of the mechanism is reduced, or the necessity of maintaining the parts of the mechanism.
The DG series can be directly installed because it does not pass through the intermediate parts, except that the accuracy of the product itself, it can also realize free–maintenance.



● Hollow rotary platform with large diameter→ simple wiring and piping

The design of a large diameter hollow hole (penetration) is realized by using one stage reduction gear mechanism to increase the diameter of the driven gear. It is suitable for the complicated wiring and piping application and so on, which makes the equipment design more succinct.

	Size(mm)	Hollow diameter
DG60	60	28
DG85R	85	33
DG130R	130	62

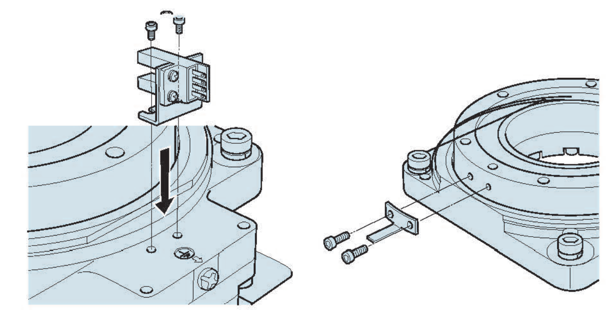


Eg: The application of DG130R.

● Simple origin regression→ save time and labor for design and parts procurement.

In order to simplify the operation of the origin regression, the company also prepares the original sensor kit for customers(Choose and purchase accessories).
The kit includes all the parts required to mark the original point. It can save the users' time and labor of installing the sensor for the design, production, and part purchase.

(DG130R sensor, example of shading plate installation)

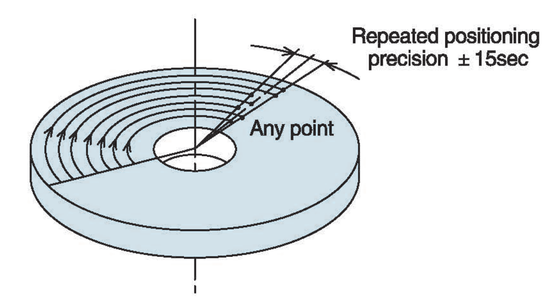


Installation of sensor

Installation of shading plate

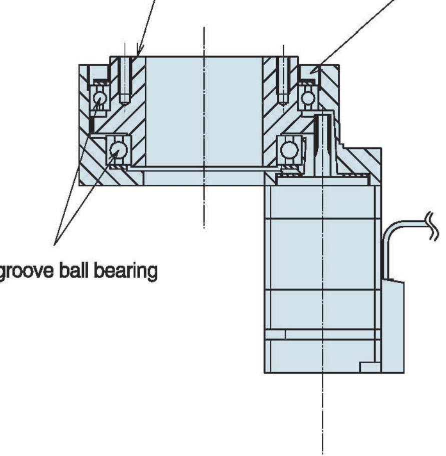
● High Positioning accuracy → repeated positioning accuracy is + 15sec Lost Motion is 2mins

The mechanism part have no backlash, because the gearbox adopts micro precision gear, and it can eliminate the backlash through its own adjusting mechanism. The repeated positioning accuracy of single direction is 15sec; while the lost motion is 2mins of two direction positioning, so it can achieve high precision positioning.

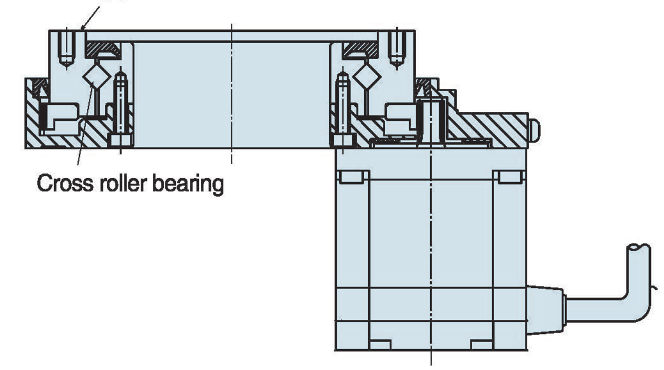


Structure drawing

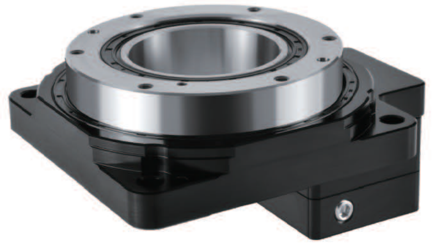
● Standard type



● High rigidity type
(DG85R、DG130R)



Ordering Model Indication



DG	60	R	5	Motor
Hollow Rotating Series	Specifications	Optional	Ratio	Motor Manufacturer & Model

R: Standard servo motor interface
B: Integrated with stepper motor
ZR: Plus right angle gearbox
F: Plus planetary gearbox

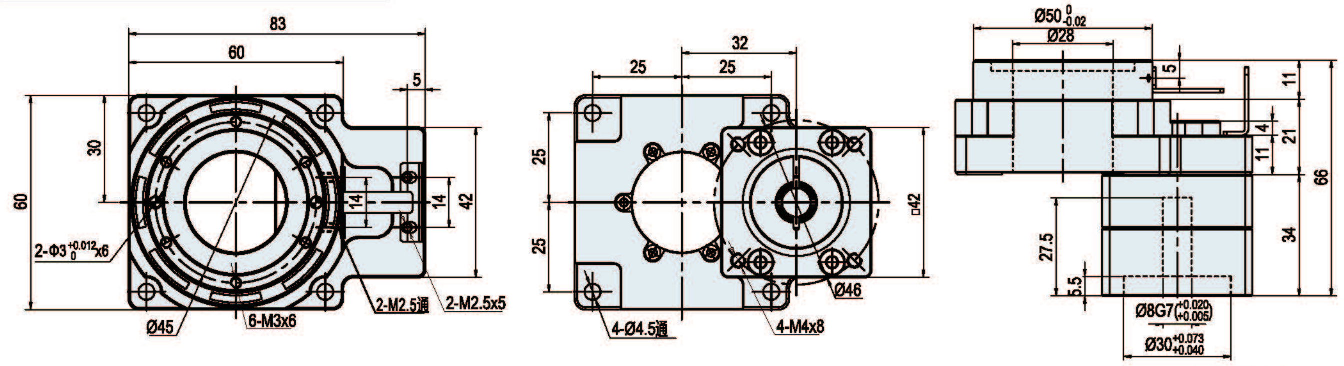
Specification

Product model	Unit	DG060-R-5	DG060-B-10	DG060-ZR-15	DG060-F-10
Ratio		5	10	15	30/40/50
Matching servo motor	W	100	Stepper	100	400/100
Bearing structure		Crossed roller bearing	Crossed roller bearing	Crossed roller bearing	Crossed roller bearing
Allowable torque	N.M	5	5	5	5
Moment of inertia	kg.m^2	4500×10^{-7}	4500×10^{-7}	4500×10^{-7}	21090×10^{-7}
Allowable plate output speed	r/min	200	200	200	200
Allowable inertia moment load	N.M	9	9	9	62/27
Allowable axial load	N	300	300	300	800
Repeat positioning accuracy	arc-sec	±5	±5	±5	±5
Positioning accuracy	arc-min	±0.5	±0.5	±0.5	⩾3
Rotating platform surface deviation (plane bounce)	mm	±0.005	±0.005	±0.005	±0.005
Rotating platform concentricity	mm	±0.01	±0.01	±0.01	±0.01
Rotating platform parallelism	mm	±0.015	±0.015	±0.015	±0.015
Accuracy life	h	25000	25000	25000	25000
Protection class		IP40	IP40	IP40	IP40
Mass	kg	0.55	1.04	1	1.23

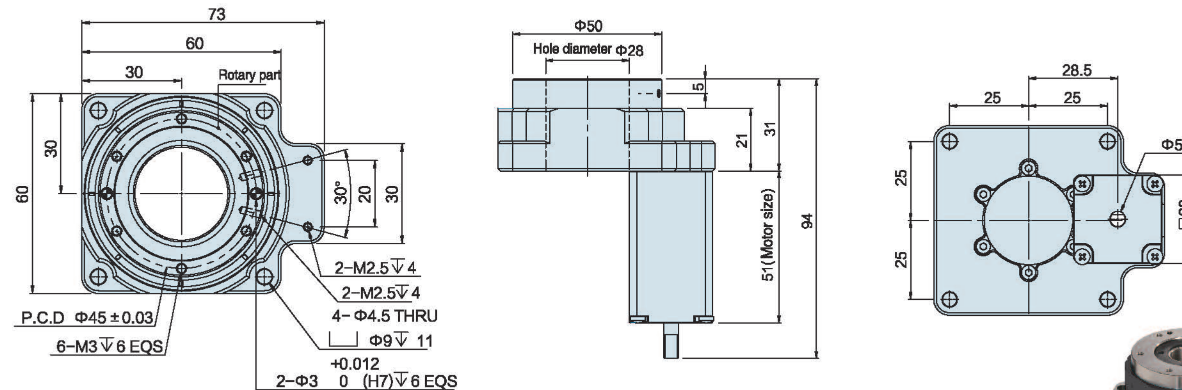
* The above technical parameters are for reference only, and the actual specs and dimensions are issued according to the data provided by customers.

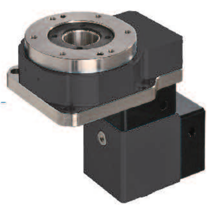
Dimensions Unit: mm

DG060-R-5 (A self assembled motor with a connecting seat)

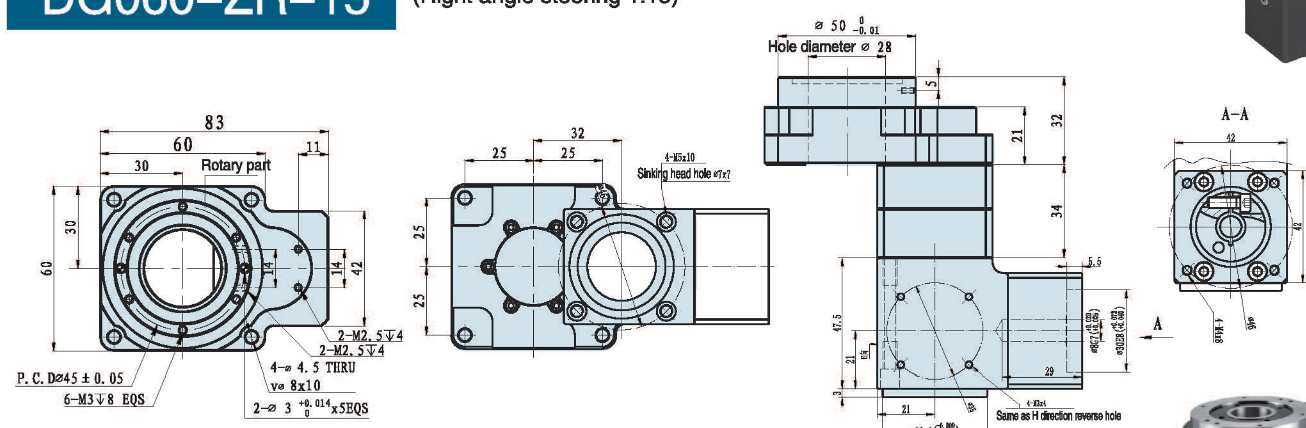


DG060-B-10 (This model contains stepper motor 42H5K-2A)

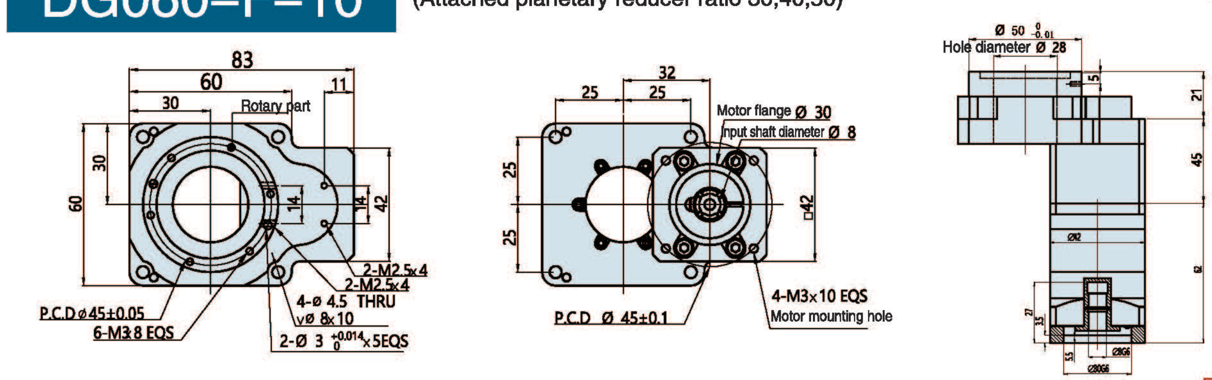




DG060-ZR-15 (Right angle steering 1:15)



DG060-F-10 (Attached planetary reducer ratio 30,40,50)



Ordering Model Indication

DG	—	85	—	R	—	5/10	—	Motor
Hollow Rotating Series		Specifications		Optional		Ratio		Motor Manufacturer & Model

R: Standard servo motor interface
B: Integrated with stepper motor
S: Integrated with servo motor
ZR: Plus right angle gearbox
F: Plus planetary gearbox

Specification

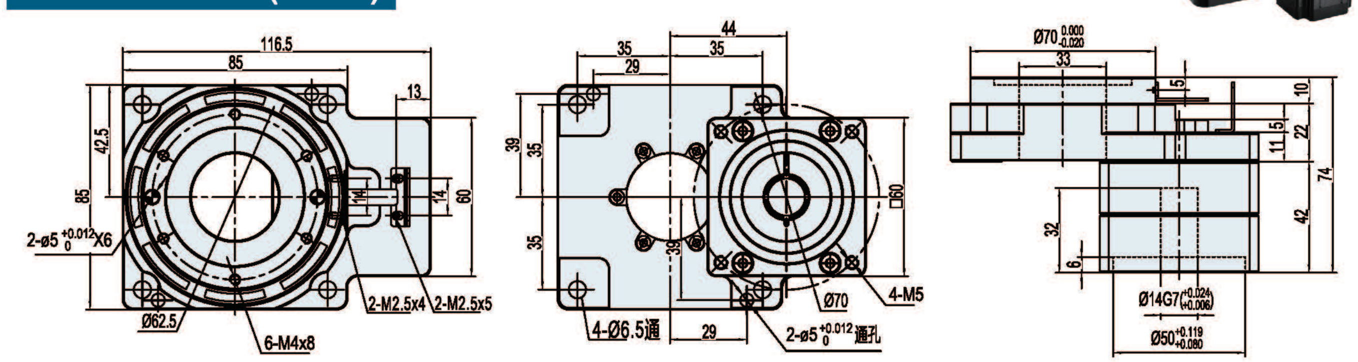
Product model	Unit	DG085-R-5	DG085-B-10	DG085-S-10	DG085-ZR-10	DG085-F-10
Ratio		5/10	10	10	20/30	30/40/50
Matching servo motor	W	400/100	100	100	100	100
Bearing structure		Crossed roller bearing	Crossed roller bearing	Crossed roller bearing	Crossed roller bearing	Crossed roller bearing
Allowable torque	N.M	20/16	20/16	20/16	20/16	20/16
Moment of inertia	$kg.m^2$	21090×10^{-7}	21090×10^{-7}	21090×10^{-7}	21090×10^{-7}	21090×10^{-7}
Allowable plate output speed	r/min	200	200	200	200	200
Allowable inertia moment load	N.M	62/27	62/27	62/27	62/27	62/27
Allowable axial load	N	800	800	800	800	800
Repeat positioning accuracy	arc-sec	±5	±5	±5	±5	±5
Positioning accuracy	arc-min	±0.5	±0.5	±0.5	⩾3	⩾3
Rotating platform surface deviation (plane bounce)	mm	±0.005	±0.005	±0.005	±0.005	±0.005
Rotating platform concentricity	mm	±0.01	±0.01	±0.01	±0.01	±0.01
Rotating platform parallelism	mm	±0.015	±0.015	±0.015	±0.015	±0.015
Accuracy life	h	25000	25000	25000	25000	25000
Protection class		IP40	IP40	IP40	IP40	IP40
Mass	kg	1.15	1.85	2.1	2.05	2.1

* The above technical parameters are for reference only, and the actual specs and dimensions are issued according to the data provided by customers.

Dimensions Unit: mm

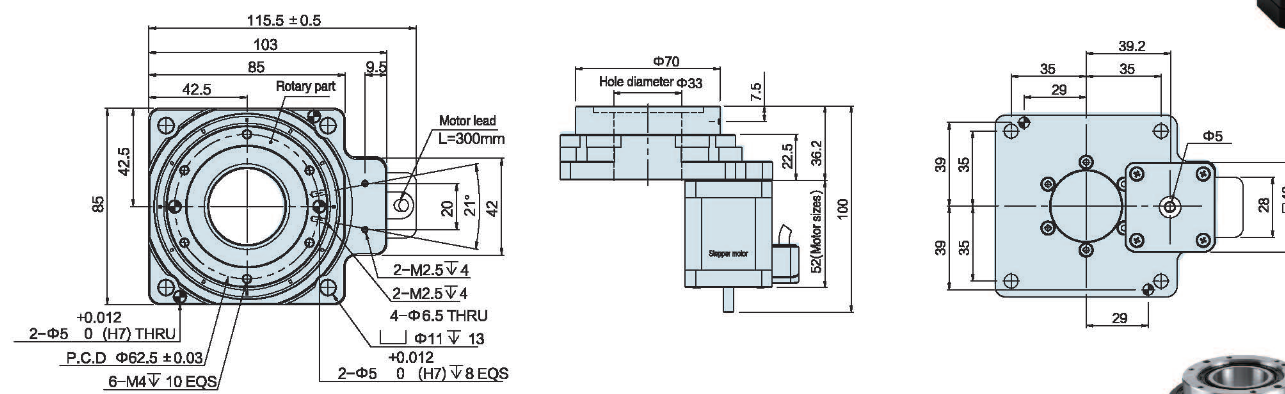
DG085-R-(5/10)

(A self assembled motor with a connecting seat)



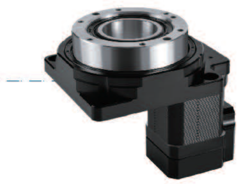
DG085-B-10

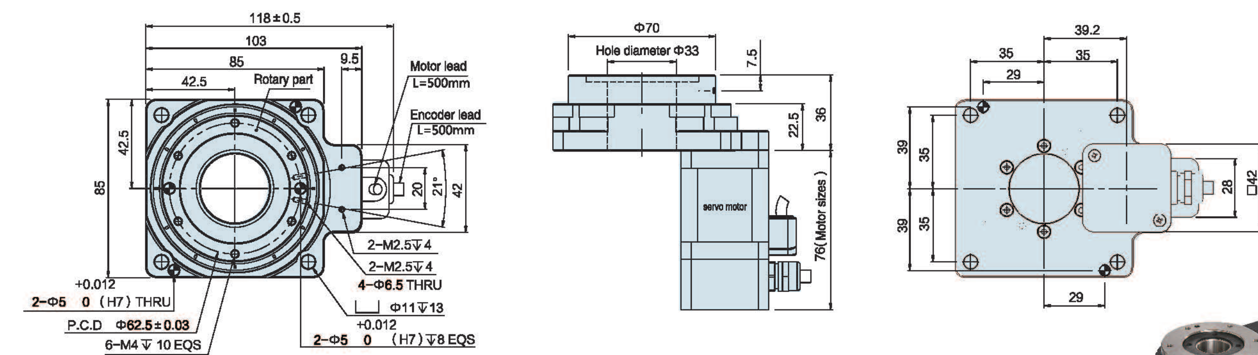
(This model contains stepper motor 57H5K-2A)



DG085-S-10

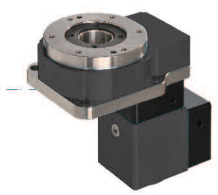
(200W This model contains Servo motor)

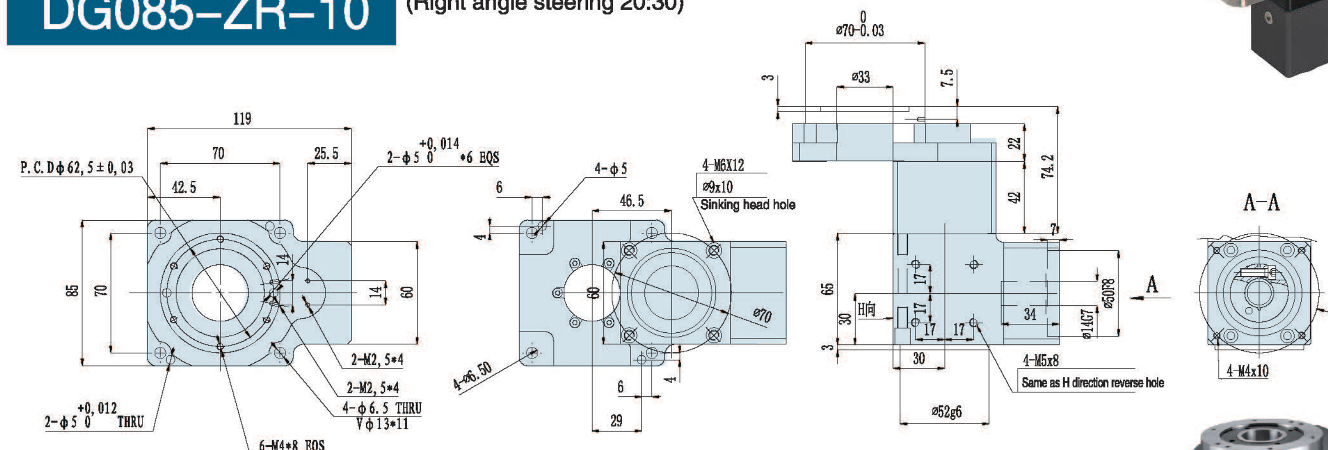




DG085-ZR-10

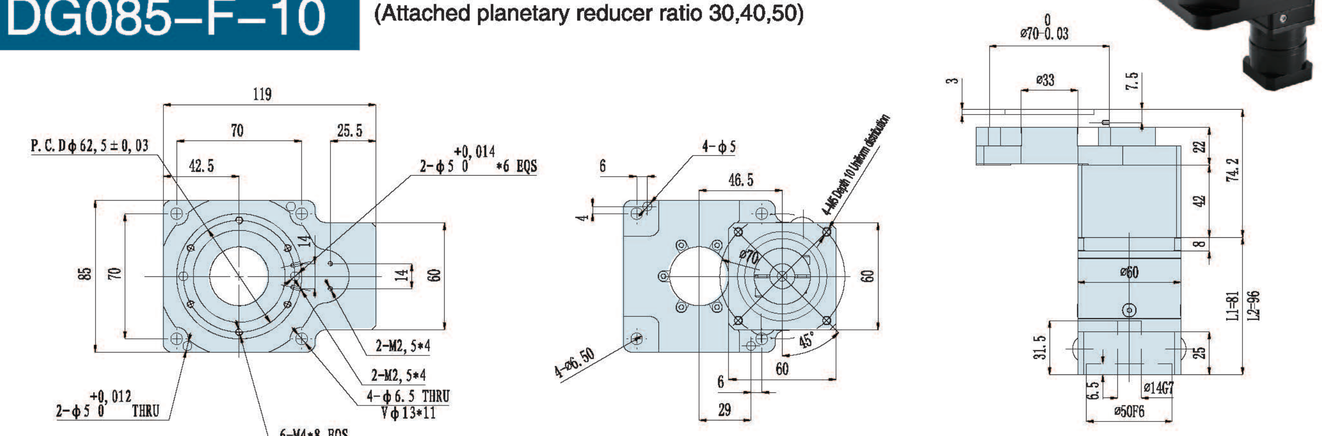
(Right angle steering 20:30)





DG085-F-10

(Attached planetary reducer ratio 30,40,50)



Ordering Model Indication

DG	—	130	—	R	—	10/18	—	Motor
Hollow Rotating Series		Specifications		Optional		Ratio		Motor Manufacturer & Model

R: Standard servo motor interface
B: Integrated with stepper motor
S: Integrated with servo motor
ZR: Plus right angle gearbox
F: Plus planetary gearbox

Specification

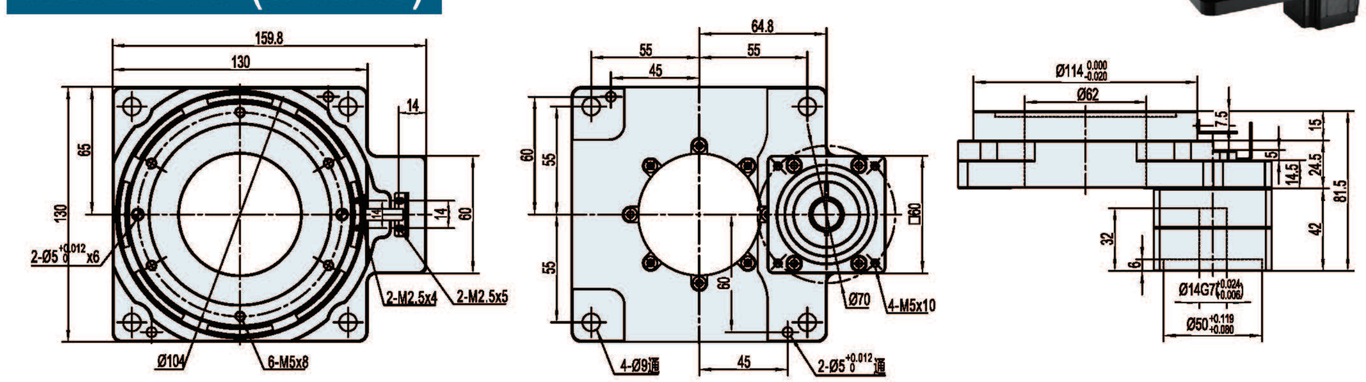
Product model	Unit	DG0130–R–10	DG130–B–18	DG130–S–18	DG130–ZR–20	DG130–F–10
Ratio		6/10/18	18	18	20/30	30/40/50
Matching servo motor	W	400	400	400	400	400
Bearing structure		Crossed roller bearing	Crossed roller bearing	Crossed roller bearing	Crossed roller bearing	Crossed roller bearing
Allowable torque	N.M	55/35	35	35	55	55/35
Moment of inertia	$kg.m^2$	110725×10^{-7}	110725×10^{-7}	110725×10^{-7}	110725×10^{-7}	110725×10^{-7}
Allowable plate output speed	r/min	200	200	200	200	200
Allowable inertia moment load	N.M	90/58	90/58	90/58	90/58	90/58
Allowable axial load	N	2500	2500	2500	2500	2500
Repeat positioning accuracy	arc–sec	±5	±5	±5	±5	±5
Positioning accuracy	arc–min	±0.5	±0.5	±0.5	⩾3	⩾3
Rotating platform surface deviation (plane bounce)	mm	±0.005	±0.005	±0.005	±0.005	±0.005
Rotating platform concentricity	mm	±0.01	±0.01	±0.01	±0.01	±0.01
Rotating platform parallelism	mm	±0.015	±0.015	±0.015	±0.015	±0.015
Accuracy life	h	25000	25000	25000	25000	25000
Protection class		IP40	IP40	IP40	IP40	IP40
Mass	kg	2.3	3.3	3.85	4.1	4.5

* The above technical parameters are for reference only, and the actual specs and dimensions are issued according to the data provided by customers.

Dimensions Unit: mm

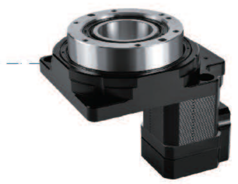
DG130–R–(6/10/18)

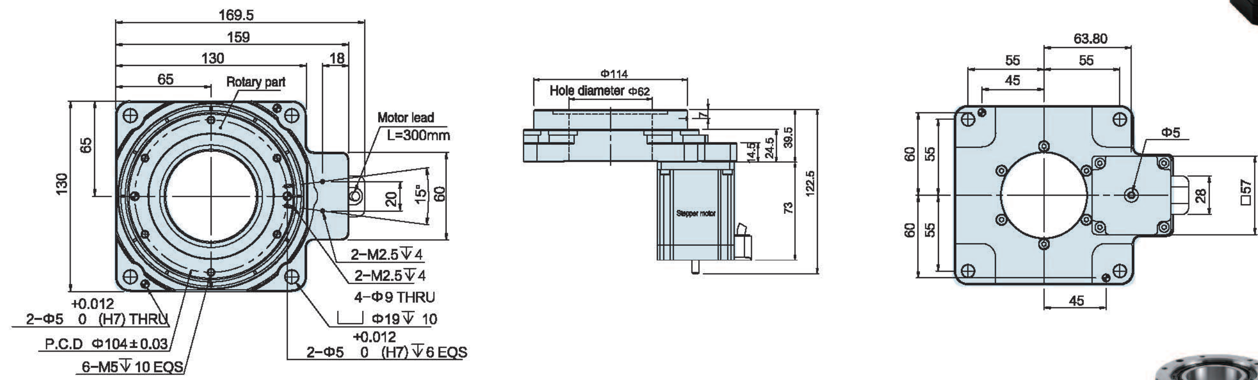
(A self assembled motor with a connecting seat)



DG130–B–18

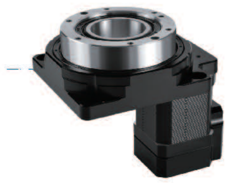
(This model contains stepper motor 57H5K–2A)

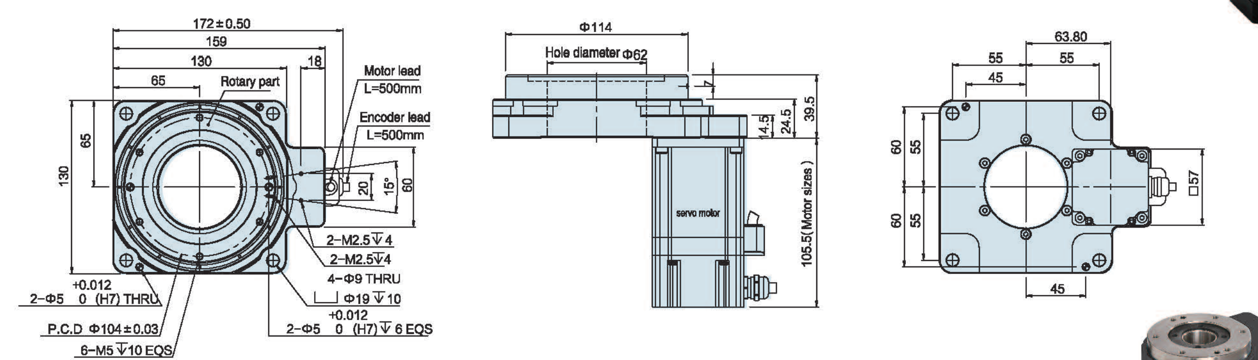




DG130–S–18

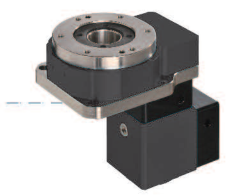
(400W This model contains Servo motor)

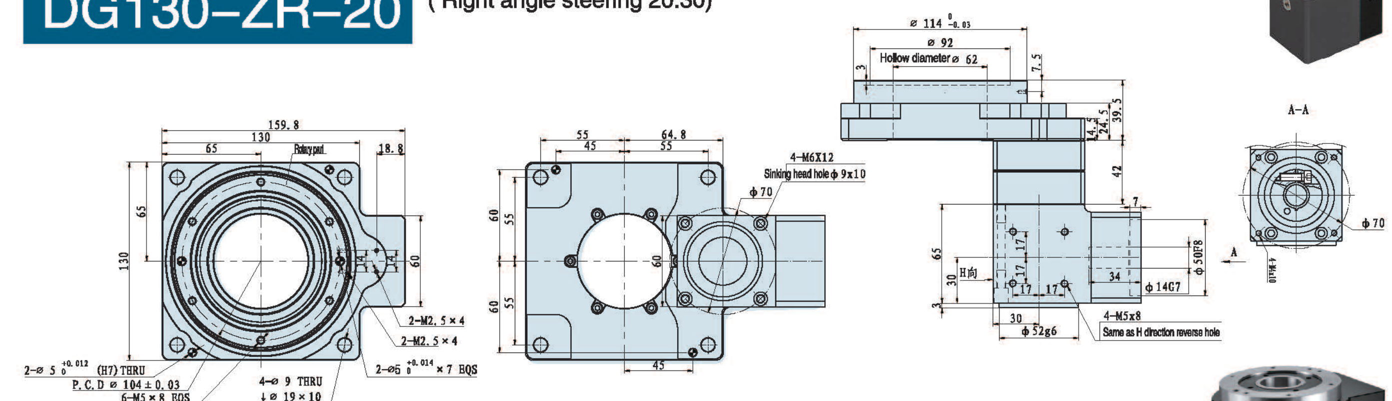




DG130–ZR–20

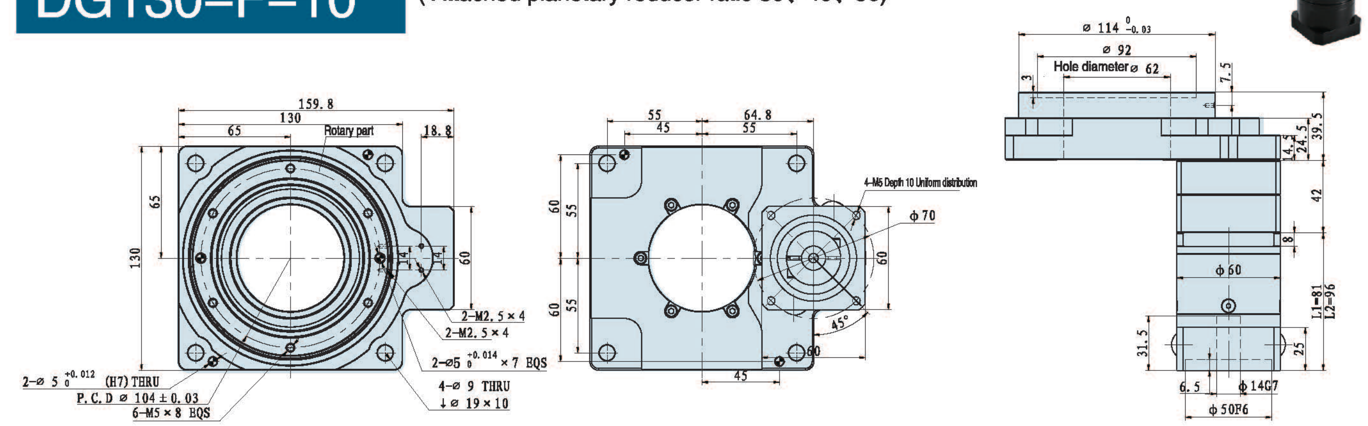
(Right angle steering 20:30)





DG130–F–10

(Attached planetary reducer ratio 30、40、50)



Ordering Model Indication

DG — 200 — R — 10/18 — Motor

- DG: Hollow Rotating Series
- 200: Specifications
- R: Optional
- 10/18: Ratio
- Motor: Motor Manufacturer & Model

R: Standard servo motor interface
B: Integrated with stepper motor
S: Integrated with servo motor
ZR: Plus right angle gearbox
F: Plus planetary gearbox

Specification

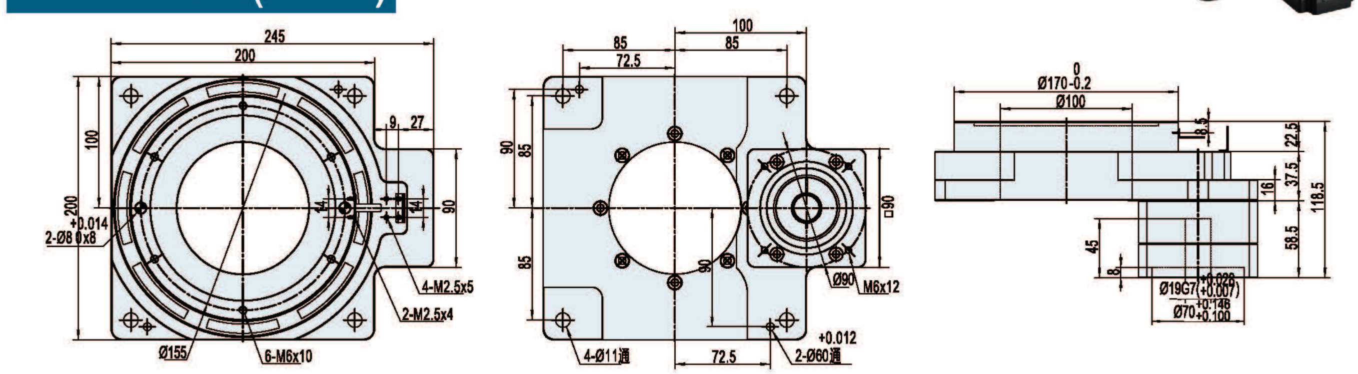
Product model	Unit	DG0200-R-10	DG200-B-18	DG200-S-18	DG200-ZR-20	DG200-F-30
Ratio		10/18	18	18	20/30	30/40/50
Matching servo motor	W	750	750	750	750	750
Bearing structure		Crossed roller bearing	Crossed roller bearing	Crossed roller bearing	Crossed roller bearing	Crossed roller bearing
Allowable torque	N.M	120/80	80	80	120/80	120/80
Moment of inertia	$kg.m^2$	876410×10^{-7}	876410×10^{-7}	876410×10^{-7}	876410×10^{-7}	876410×10^{-7}
Allowable plate output speed	r/min	200	200	200	200	200
Allowable inertia moment load	N.M	140/96	140/96	140/96	140/96	140/96
Allowable axial load	N	4500	4500	4500	4500	4500
Repeat positioning accuracy	arc-sec	±5	±5	±5	±5	±5
Positioning accuracy	arc-min	±0.5	±0.5	±0.5	⩾3	⩾3
Rotating platform surface deviation (plane bounce)	mm	±0.005	±0.005	±0.005	±0.005	±0.005
Rotating platform concentricity	mm	±0.01	±0.01	±0.01	±0.01	±0.01
Rotating platform parallelism	mm	±0.015	±0.015	±0.015	±0.015	±0.015
Accuracy life	h	25000	25000	25000	25000	25000
Protection class		IP40	IP40	IP40	IP40	IP40
Mass	kg	7.85	10.3	11	12.5	9.9

* The above technical parameters are for reference only, and the actual specs and dimensions are issued according to the data provided by customers.

Dimensions Unit: mm

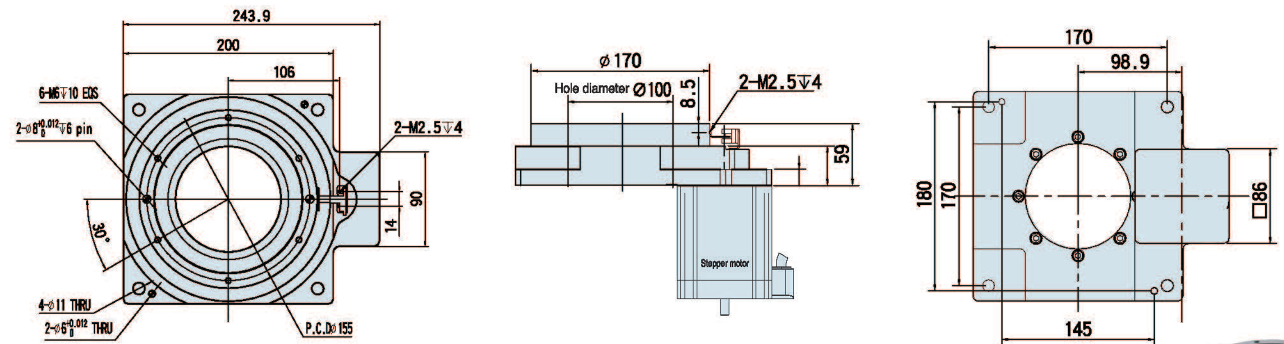
DG200-R-(10/18)

(A self assembled motor with a connecting seat)



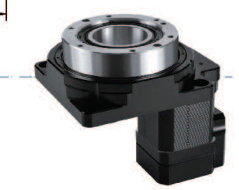
DG200-B-18

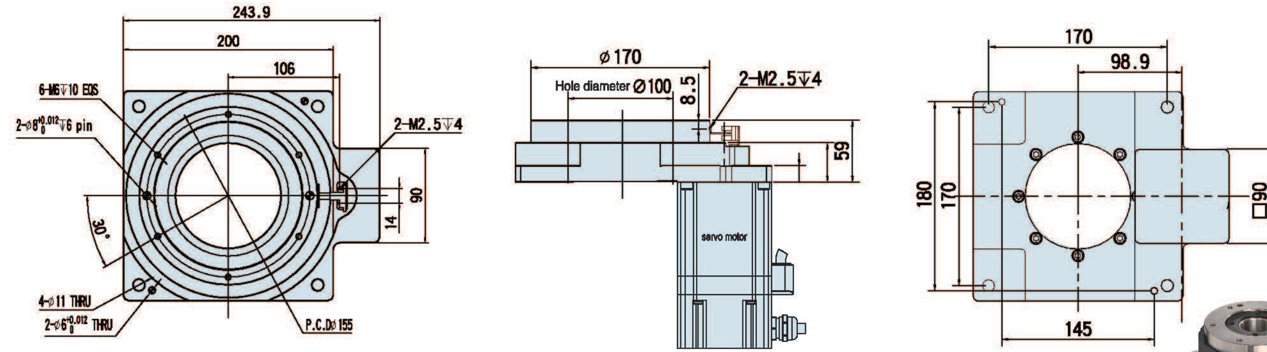
(This model contains stepper motor 86H5K-2A)



DG200-S-18

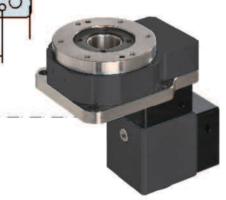
(750W This model contains Servo motor)

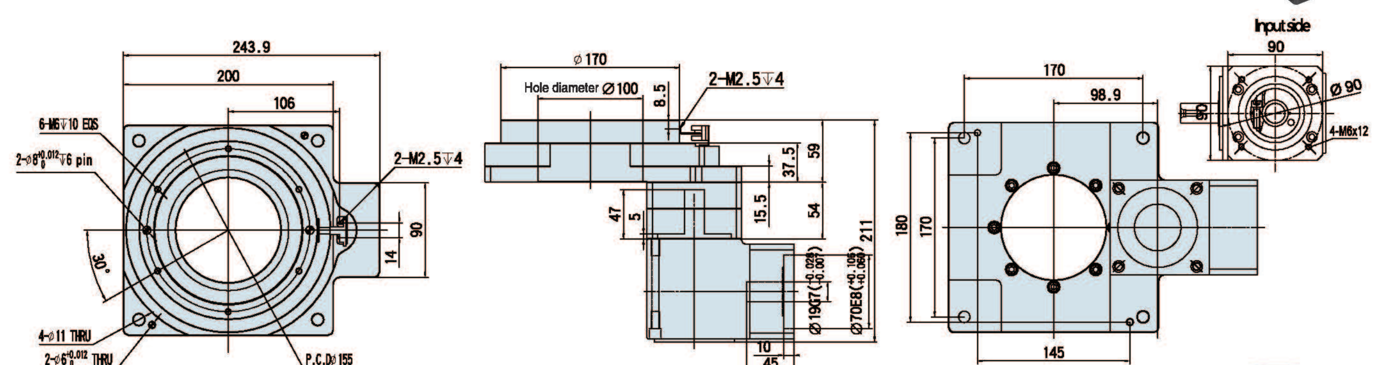




DG200-ZR-20

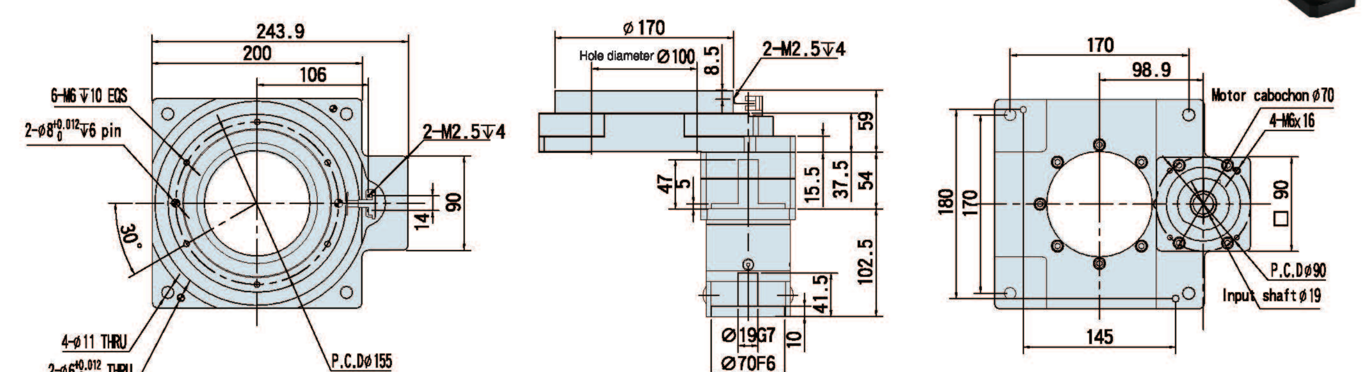
(Right angle steering 20:30)



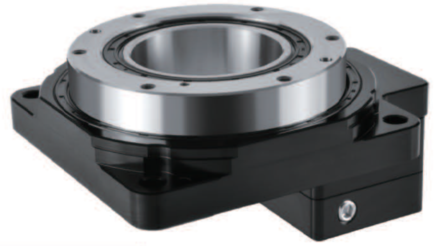


DG200-F-30

(Attached planetary reducer ratio 30,40,50)



Ordering Model Indication



DG — **280** — **R** — **10/18** — **Motor**

- DG: Hollow Rotating Series
- 280: Specifications
- R: Optional
- 10/18: Ratio
- Motor: Motor Manufacturer & Model

R: Standard servo motor interface
B: Integrated with stepper motor
S: Integrated with servo motor
F: Plus planetary gearbox

Specification

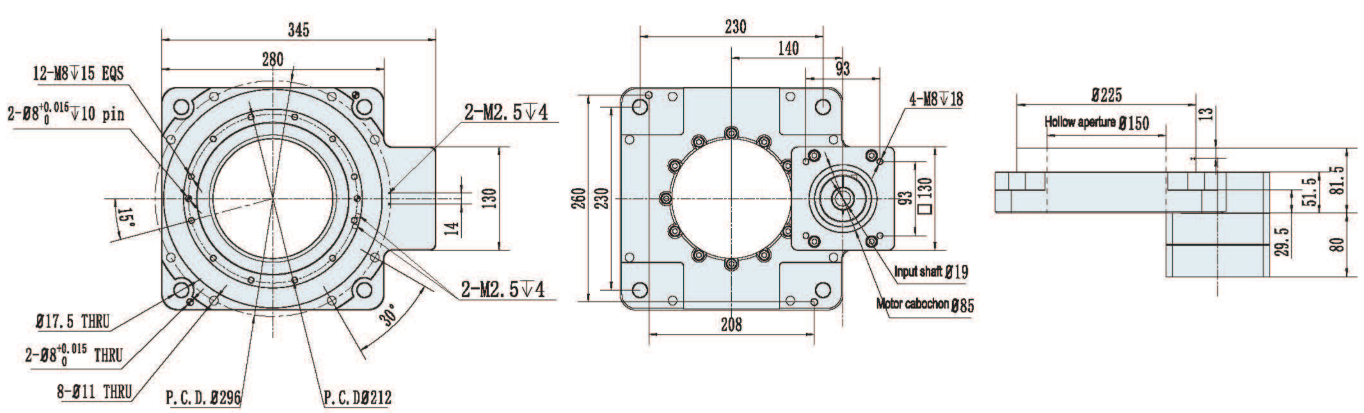
Motor Model	110 Stepping Motor		1500W AC Servo Motor	
Bearings of Rotating Table	Crossed Roller Bearing		Crossed Roller Bearing	
Ratio	1:10	1:18	1:10	1:18
Rated Output Torque	126Nm	95Nm	126Nm	95Nm
Allowable Disk Speed	≤200r/min (/Intermittent Operation)		≤200r/min (Intermittent Operation)	
Max.Load of Inertia	350Nm	300Nm	350Nm	300Nm
Max.Axial Force	7500N		7500N	
Positioning Accuracy	≤1arcmin		≤1arcmin	
Repeatability	≤20arcsec		≤20arcsec	
Parallelism of Rotating Table	≤0.01mm		≤0.01mm	
Concentricity of Rotating Table	≤0.01mm		≤0.01mm	
Life	20000h(Intermittent Operation)		20000h(Intermittent Operation)	
Degree of Protection	IP40		IP40	
Weight	19Kg		19Kg	

* All specifications, dimensions and design characteristics shown in this catalogue are subject to change without notice.

Dimensions Unit: mm

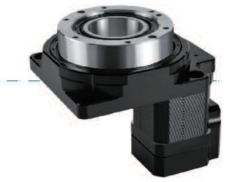
DG280-B-(10/18)

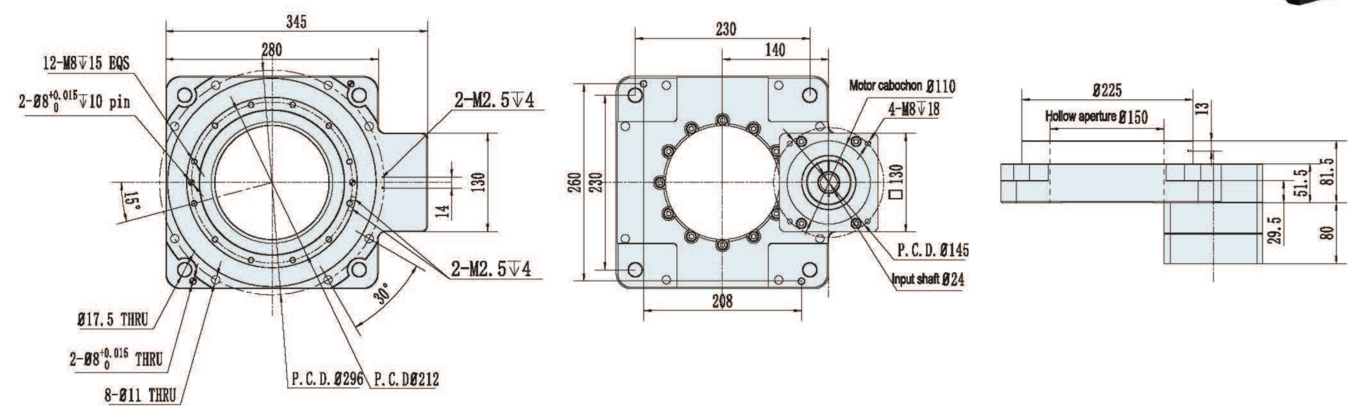
(This model contains stepper motor 110H5K-2A)



DG280-S-(10/18)

(This model contains Servo motor)



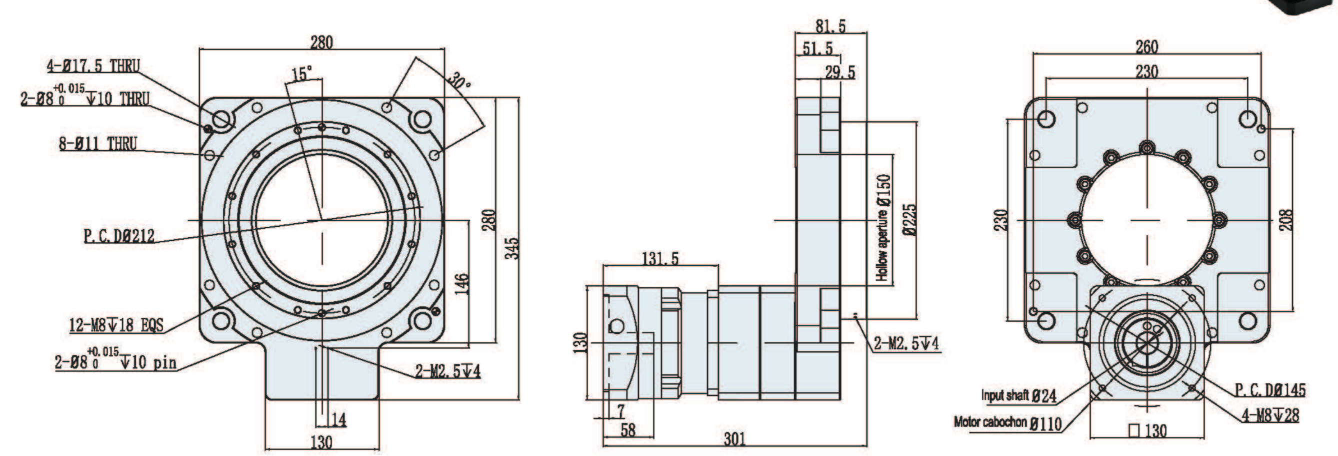


Application Examples Technical Data

Description		i^2	DN115 Direct Junction Planetary Reducer
Nominal Output Torque T2N[3]	Nm	3	208
		4	290
		5	330
		7	300
		10	230
Emergency Stop Torque T2N[3]	Nm		2.5 Times of Nominal Output Torque
Nominal Input Speed	rpm		4000
Max. Input Speed	rpm		8000
Backlash	arcmin		≤5
Torsional Stiffness	Nm/arcmin		25
Max. Radial Force[4]	N		6700
Max. Axial Force[4]	N		3000
Service Life	Hr		20000(Continuous operation reduces service life 50%)
Efficiency	%		96%
Operating Temp	°C		-10°C ~ +90°C
Degree of Protection			IP 65
Lubrication			Synthetic Lubricating Grease
Noise	dB(A)		≤63

DG280-F-30

(Attached planetary reducer ratio 30、40、50)



Ordering Model Indication

DG — 350 — R — 10/18 — Motor

- DG: Hollow Rotating Series
- 350: Specifications
- R: Optional
- 10/18: Ratio
- Motor: Motor Manufacturer & Model

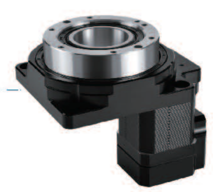
R: Standard servo motor interface
S: Integrated with servo motor
F: Plus planetary gearbox

Specification

Motor Model	1500W AC Servo Motor	
Bearings of Rotating Table	Crossed Roller Bearing	
Ratio	1:10	1:18
Rated Output Torque	356Nm	356Nm
Allowable Disk Speed	≤200r/min(Intermittent Operation)	
Max.Load of Inertia	450Nm	356Nm
Max.Axial Force	10000N	11500N
Positioning Accuracy	≤1.5arcmin	≤1. 5arcmin
Repeatability	≤20arcsec	≤20arcsec
Parallelism of Rotating Table	≤0.02mm	≤0.02mm
Concentricity of Rotating Table	≤0.02mm	≤0.02mm
Life	20000h(Intermittent Operation)	
Degree of Protection	IP40	IP40
Weight	41Kg	41Kg

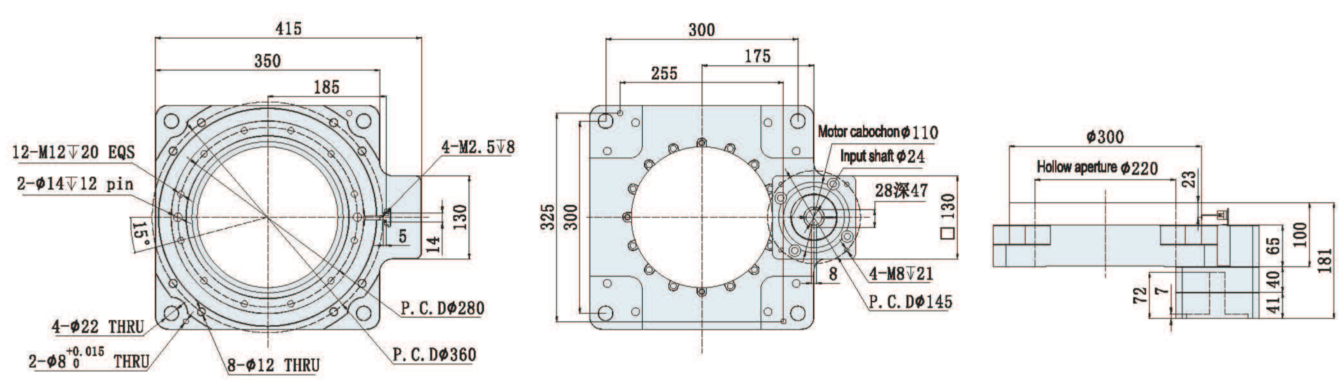
* All specifications, dimensions and design characteristics shown in this catalogue are subject to change without notice.

Dimensions Unit: mm

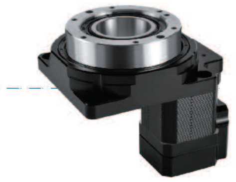


DG350-S-(1/10)

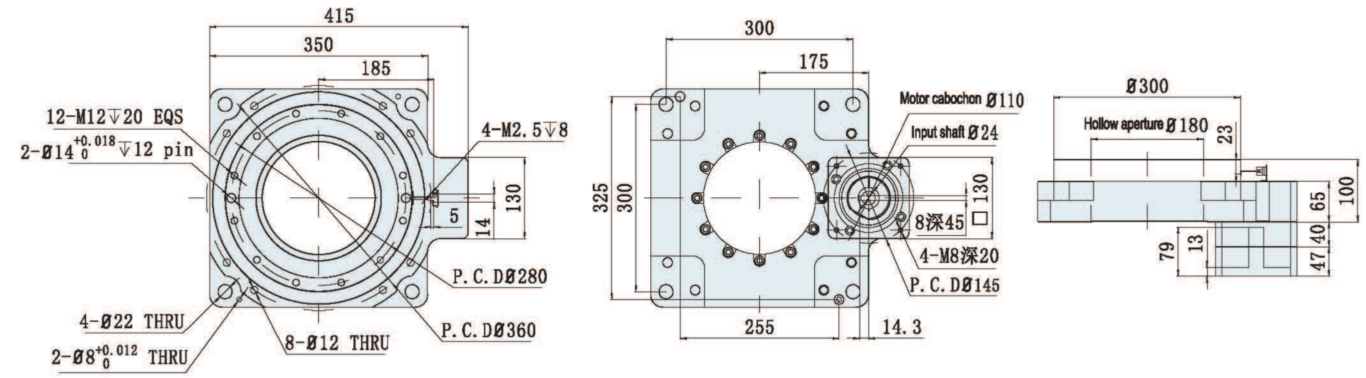
(1500W This model contains Servo motor)



DG350-S-(1/18)



(1500W This model contains Servo motor)

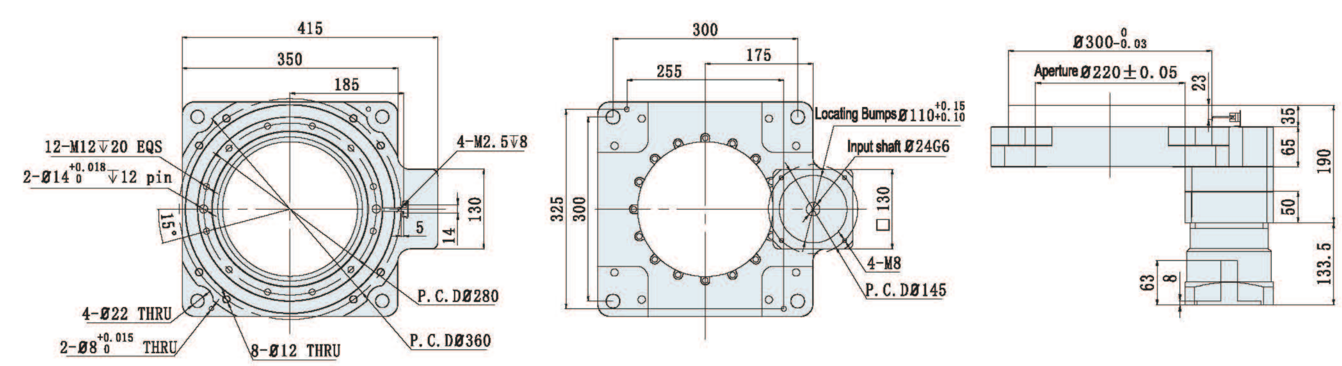


Application Examples Technical Data

Description		i²	DN115 Direct Junction Planetary Reducer
Nominal Output Torque T2N³	Nm	3	220
		4	300
		5	360
		7	360
		10	240
Emergency Stop Torque T2N³	Nm		2.5 Times of Nominal Output Torque
Nominal Input Speed	rpm		3000
Max. Input Speed	rpm		6000
Backlash	arcmin		≤5
Torsional Stiffness	Nm/arcmin		25
Max. Radial Force⁴	N		6200
Max. Axial Force⁴	N		4000
Service Life	Hr		20000(Continuous operation reduces service life 50%)
Efficiency	%		96%
Operating Temp	℃		-10℃ ~ +90℃
Degree of Protection			IP 65
Lubrication			Synthetic Lubricating Grease
Noise	dB(A)		≤63

DG350-F-30

(Attached planetary reducer ratio 30、40、50)



Ordering Model Indication

DG — 450 — R — 10/18 — Motor

- DG: Hollow Rotating Series
- 450: Specifications
- R: Optional
- 10/18: Ratio
- Motor: Motor Manufacturer & Model

R: Standard servo motor interface
S: Integrated with servo motor
F: Plus planetary gearbox

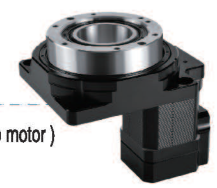
Specification

Motor Model	3KW AC Servo Motor
Bearings of Rotating Table	Crossed Roller Bearing
Ratio	1:10
Rated Output Torque	356Nm
Allowable Disk Speed	≤200r/min (Intermittent Operation)
Max.Load of Inertia	600Nm
Max.Axial Force	15000N
Positioning Accuracy	≤2arcmin
Repeatability	≤20arcsec
Parallelism of Rotating Table	≤0.02mm
Concentricity of Rotating Table	≤0.02mm
Life	20000h(Intermittent Operation)
Degree of Protection	IP40
Weight	80Kg

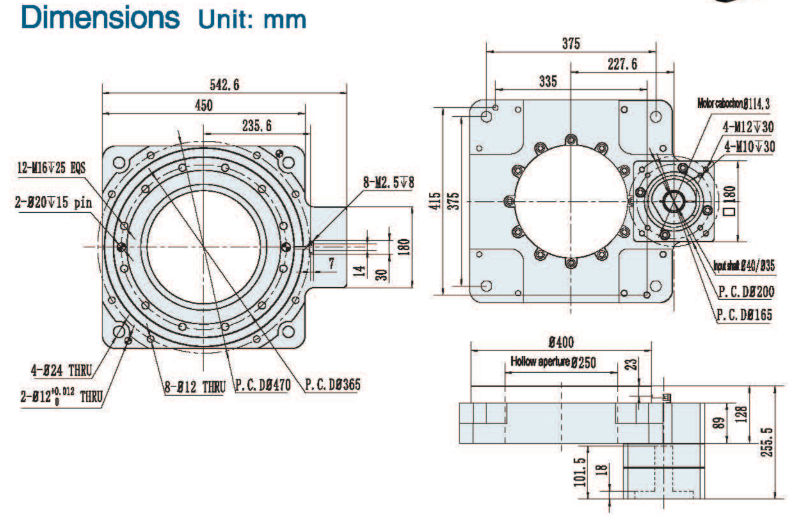
* All specifications, dimensions and design characteristics shown in this catalogue are subject to change without notice.

DG450–S–(1/10)

(3KW This model contains Servo motor)



Dimensions Unit: mm



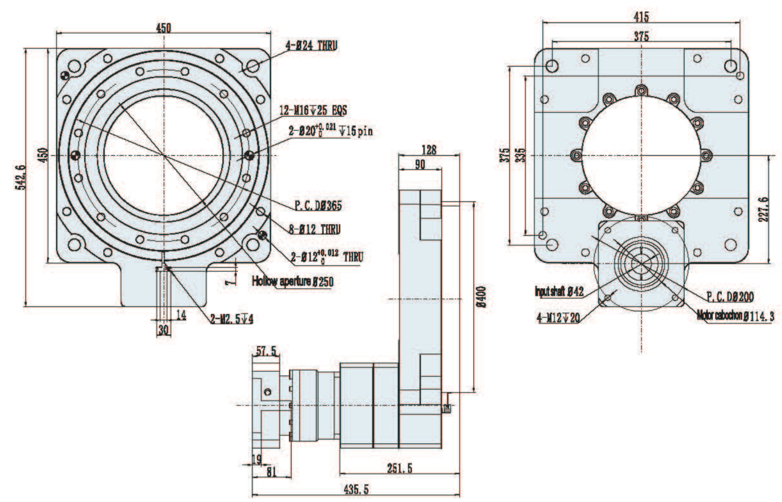
Application Examples Technical Data

Description		i²	DN142 Direct Junction Planetary Reducer
Nominal Output Torque T2N³	Nm	3	340
		4	500
		5	600
		7	600
		10	380
Emergency Stop Torque T2N³	Nm		2.5 Times of Nominal Output Torque
Nominal Input Speed	rpm		3000
Max. Input Speed	rpm		6000
Backlash	arcmin		≤5
Torsional Stiffness	Nm/arcmin		50
Max. Radial Force⁴	N		9000
Max. Axial Force⁴	N		4200
Service Life	Hr		20000(Continuous operation reduces service life 50%)
Efficiency	%		96%
Operating Temp	°C		-10°C ~ +90°C
Degree of Protection			IP 65
Lubrication			Synthetic Lubricating Grease
Noise	dB(A)		≤65

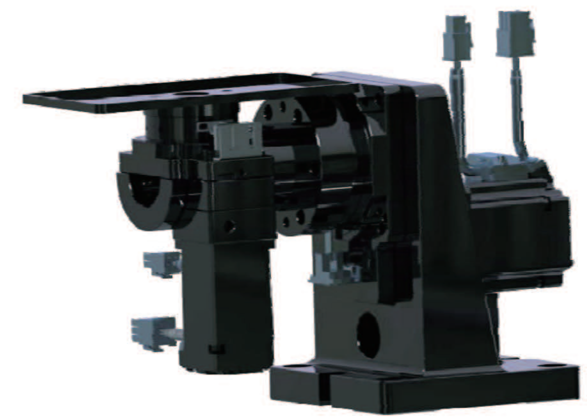
DG450–F–30

(Attached planetary reducer ratio 30、40、50)

Dimensions Unit: mm



DGS Series
Miniature rotary axis



Rotary shaft model code

DGS085 - 060 - 100 - SVA-SVB

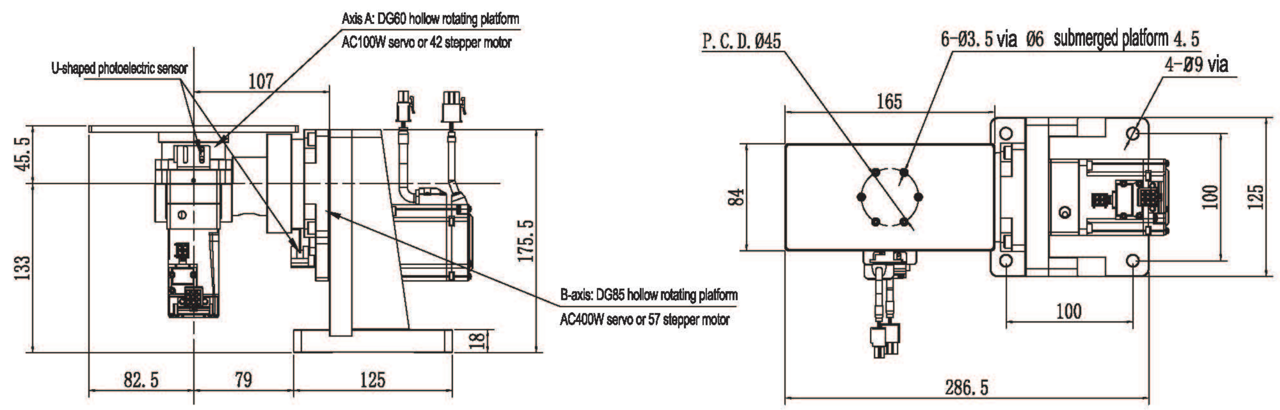
Axis A	Axis B	Turning Radius	Motor type
060 / 085 130 / 200	060 / 085 130 / 200	Customization	SV: AC Servo motor ST: Stepping motor

Technical Parameter

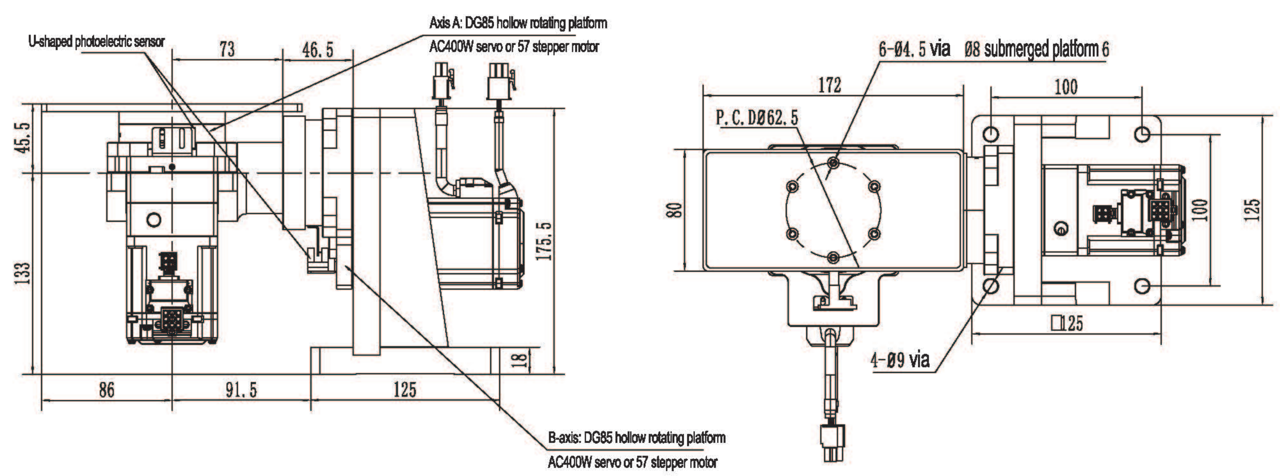
Parameter items	DGS085-060-SV/ST		DGS085-085-SV/ST		DGS200-130-SV/ST	
	A Axis	B Axis	A Axis	B Axis	A Axis	B Axis
Model	DG060-05	DG085-05	DG085-05	DG085-05	DG200-10	DG130-10
Allowable Torque	5Nm		20Nm		52Nm	
Allowable Load	3Kg*		10Kg*		20Kg*	
Rotation Angle	360°	180°	360°	180°	360°	180°
Rotation Accuracy	0.5arcmin		0.5arcmin		0.5arcmin	
Repeat positioning accuracy	5arcsec		5arcsec		5arcsec	
Max turning radius	82mm (Customizable)		86mm (Customizable)		130mm (Customizable)	
Rotational parallelism	0.02mm		0.02mm		0.02mm	
Rotational concentricity	0.02mm		0.02mm		0.02mm	
Disk rotation amplitude	0.005mm		0.005mm		0.005mm	
Allowable rotating speed	200r/min		200r/min		200r/min	
Protection level	IP40		IP40		IP40	
Motor configuration	100W Sevor Motor/42 Stepper Motor	400W Sevor Motor/57 Stepper Motor	400W Sevor Motor/57 Stepper Motor	400W Sevor Motor/57 Stepper Motor	750W Sevor Motor/86 Stepper Motor	400W Sevor Motor/57 Stepper Motor

External Dimensions

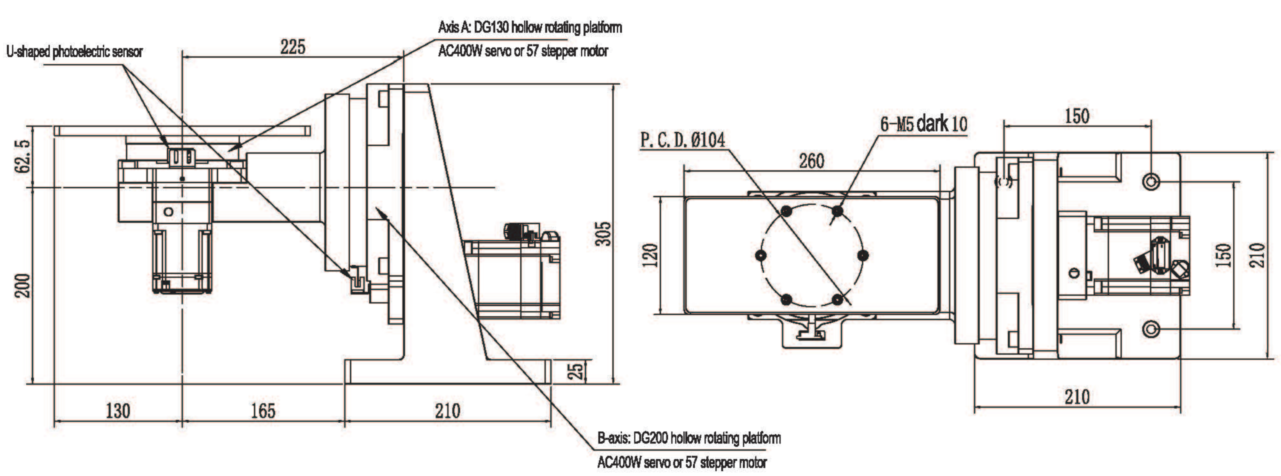
DGS085-060-SV/ST



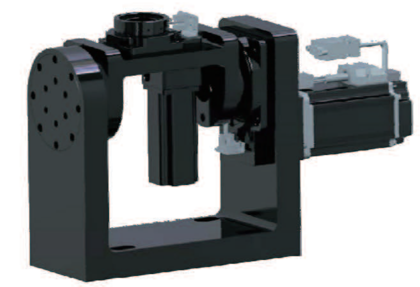
DGS085-085-SV/ST



DGS200-130-SV/ST



DGT Series
Micro Rotary Table



Rotary Table Model Code

DGT130 - 130 - 200 - SVA-SVB

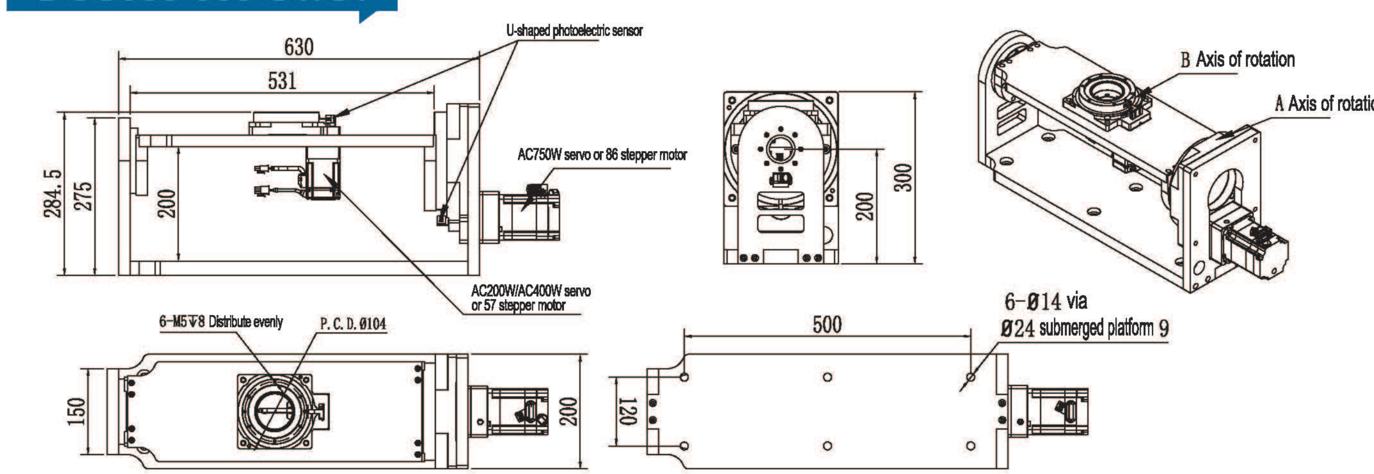
Axis A	Axis B	Plate Length	Motor type
060 / 085 130 / 200	060 / 085 130 / 200	Customization	SV: AC Servo motor ST: Stepping motor

Technical Parameter

Parameter items	DGT200-130-SV/ST-630	
	A Axis	B Axis
Model	DG200-10	DG130-18
Max. Torque	32Nm	
Max.L oad Torque	35Kg*	
Rotation Angle	100°	360°
Rotation Positioning Accuracy	1arcmin	
Repeatability	15arcsec	
Turning Radius	255mm (Customizable)	
Parallelism of Rotating Table	0.015mm	
Concentricity of Rotating Table	0.01mm	
Max.Speed	200r/min	
Degree of Protection	IP40	
Motor	750W Sevor Motor/86 Stepper Motor	400W Sevor Motor/57 Stepper Motor

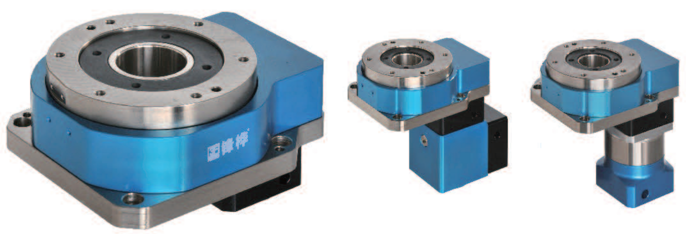
External Dimensions

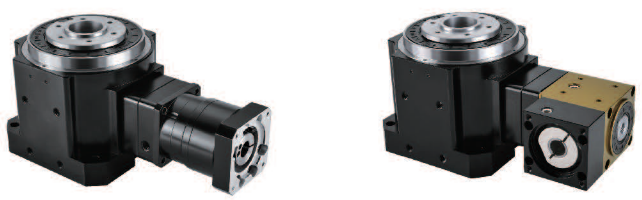
DGS085-060-SV/ST



Hollow Rotary Actuator

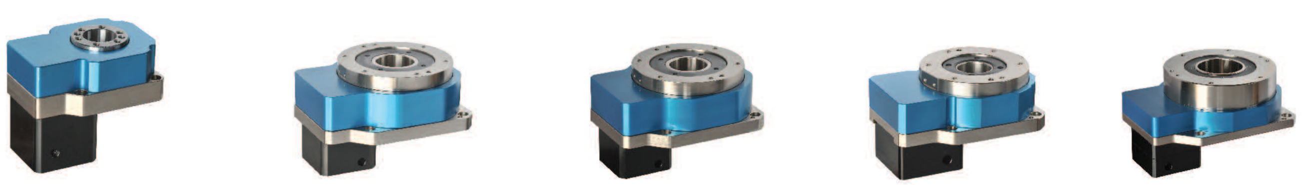
ZK





- Working objects can be locked directly
  The rotating disk surface can directly lock the working objects, and therefore improve the convenience of the workpiece transfer.
- Wiring convenience
  Featured with a hollow design, the rotating platform is convenient for wiring or piping.

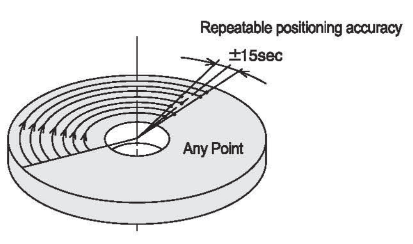
- Alternative D.D motor and cam splitter
  Straight lines motions and circular motions are two kinds of mechanical movements. Linear motion are mainly based on various types of slides, while circular motions are the most representative motion of cam indexers. And due to the maturity of technology and the accuracy requirement of equipment, D.D motor is becoming more and more popular. However, the traditional splitter has been unable to meet the needs of any segmentation. Though D. D Motor can be applied in multiple ways and with high precision, its high price is the main factors that make user reconsider. ZK series hollow rotating table has successfully got a balance between the cam indexers and D.D motor. It fills the functional requirements that not only can greatly reduce the cost of D.D Motor, but also can meet the high-precision and digital control that the cam divider can't provide.



ZK60-5-5A　　ZK100-8　　ZK130-10　　ZK200-10　　ZK275-10

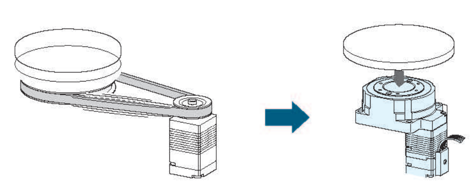
- High positioning accuracy. Repeatable positioning accuracy is ±15 sec and idling accuracy is 2 min

Ultra-precision machined gears are used in the speed reduction mechanism to eliminate the backlash through its own adjustment mechanism, thus there will be no backlash in the part of mechanism. As repeated positioning accuracy is ±15 sec in one direction and idling precision is 2 min in two directions, positioning with high accuracy is possible.

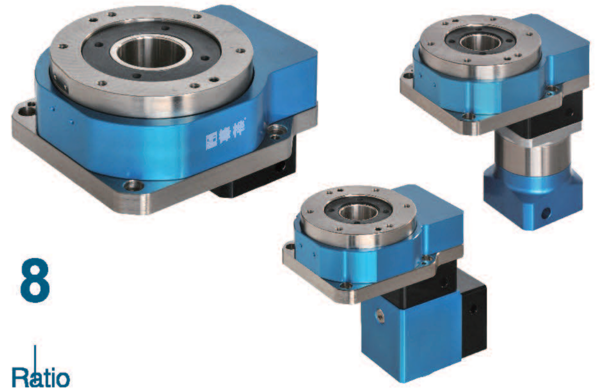


- Direct connection - simple design enhances trust

The worktable and robot arm of the equipment can be installed directly on the hollow output platform. When the general equipment positions and operates by means of pulleys and other mechanical parts. It is mostly affected by the transmission efficiency of the mechanical parts and therefore the accuracy is reduced, or there is a need to maintain the parts of the mechanism. While the ZK series hollow rotary actuators can be installed directly without intermediate parts. Therefore, in addition to the direct use of the accuracy of the actuator itself, maintenance can be avoided.



Ordering Model Indication



ZK — 100 — R — 8

Hollow Rotating Series	Specifications	Optional(Selectable)	Ratio
ZK	60 100 130 200 275	B: Integrated with stepper motor S: Integrated with servo motor R: Standard servo motor interface P: Attached planetary reducer	5 8 10

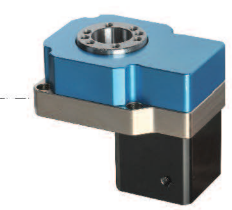
The following single rotary table sizes
Right-angle and planetary gearboxes can be connected
For specific dimensions, please consult the sales engineer

Specification

Model	ZK60-5	ZK100-8	ZK130-10	ZK200-10	ZK275-10
Bearing of rotate table	Deep groove ball+Thrust ball bearing	Tapered roller bearing	Tapered roller bearing	Tapered roller bearing	Tapered roller bearing
Allowable torque (N.m)	5	45	45	80	80
Precision lifetime	15000Hrs	20000Hrs	20000Hrs	20000Hrs	20000Hrs
Allowable speed (rpm)	200(Plate)	200(Plate)	200(Plate)	200(Plate)	200(Plate)
Ratio	5	8	10	10	10
Repeated accuracy(arc-sec)	≤15	≤10	≤10	≤10	≤10
Positioning accuracy(arc-min)	≤1	≤1	≤1	≤1	≤1
Parallelism of rotate plate(mm)	≤0.02	≤0.02	≤0.02	≤0.02	≤0.02
Coaxiality of rotate plate(mm)	≤0.02	≤0.02	≤0.02	≤0.02	≤0.015
Protection Class	IP40	IP40	IP40	IP40	IP40

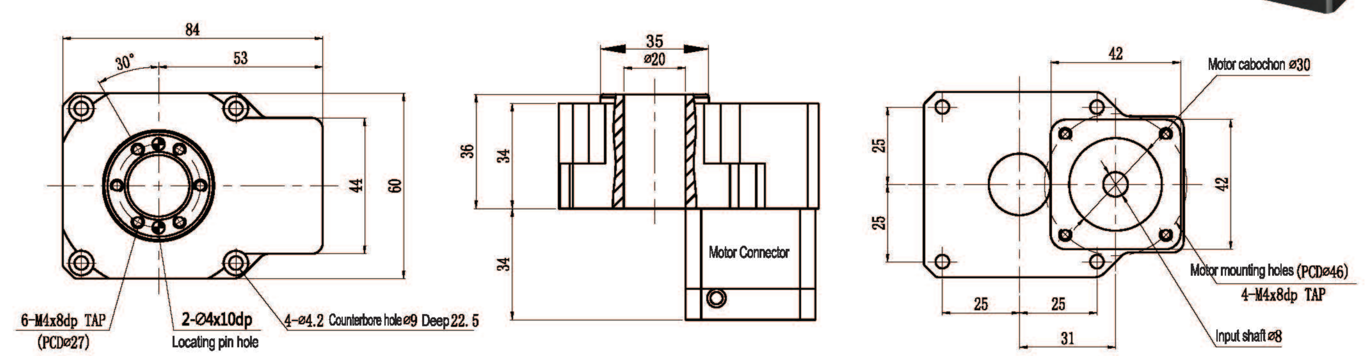
P.S: Circumferential unit：1 rpm=360° 1° =60'(arc-min) 1'=60"(arc-sec)
Circumferential error conversion linear error:Disc diameter×3.14159÷(360° ×60'×60")The value of backlash

Dimensions　Unit: mm

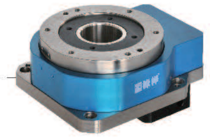


ZK60-5

The following single rotary table sizes, Right-angle and planetary gearboxes can be connected,
For specific dimensions, please consult the sales engineer

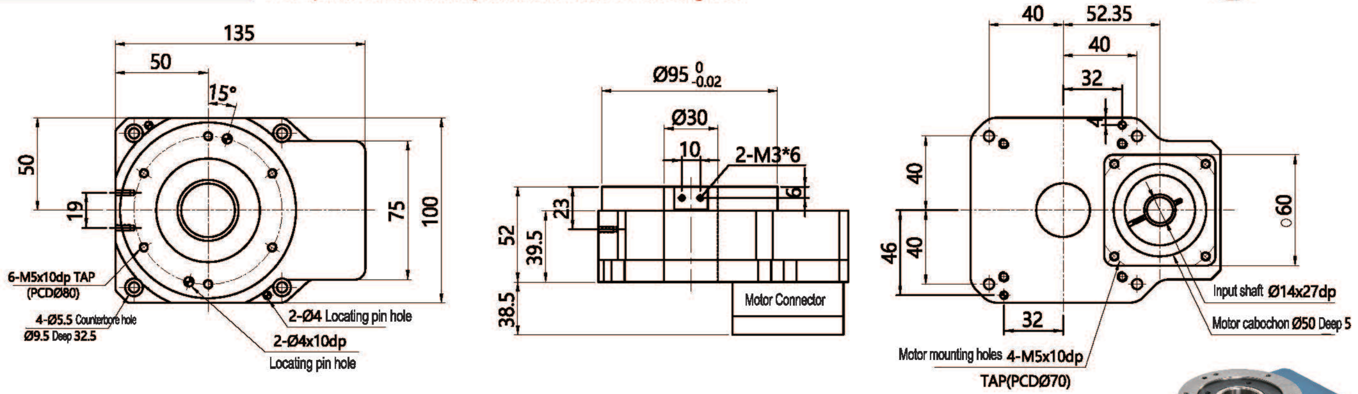


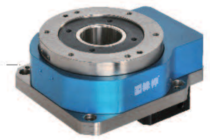
Dimensions Unit: mm



ZK100-8

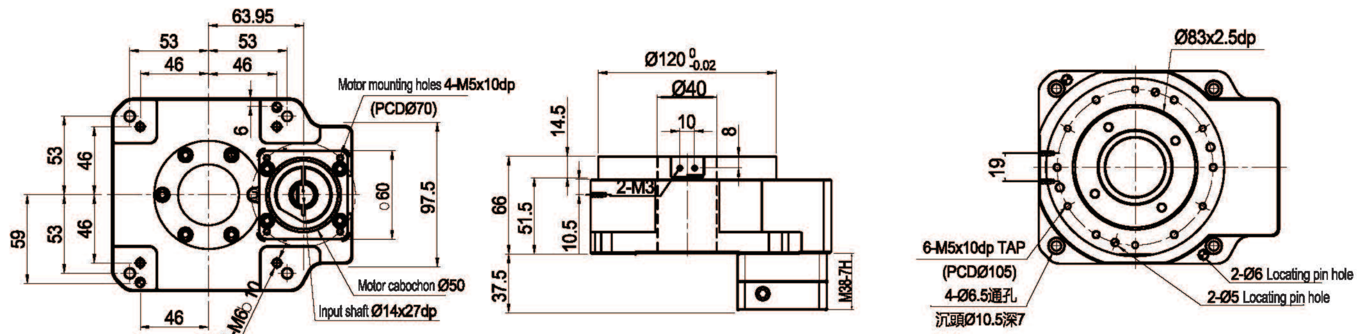
The following single rotary table sizes, Right-angle and planetary gearboxes can be connected, For specific dimensions, please consult the sales engineer

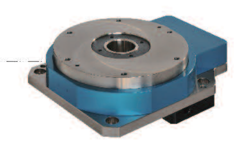




ZK130-10

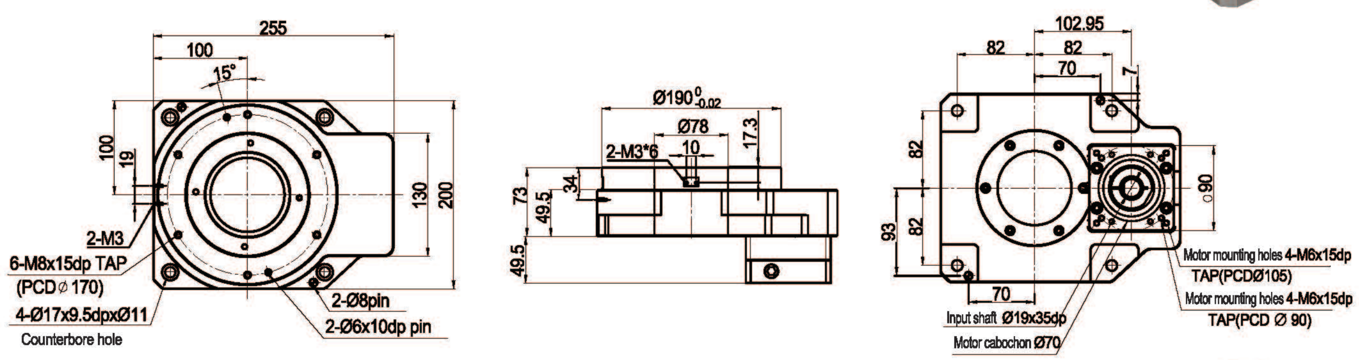
The following single rotary table sizes, Right-angle and planetary gearboxes can be connected, For specific dimensions, please consult the sales engineer

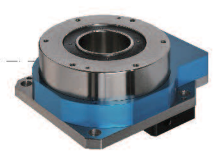




ZK200-10

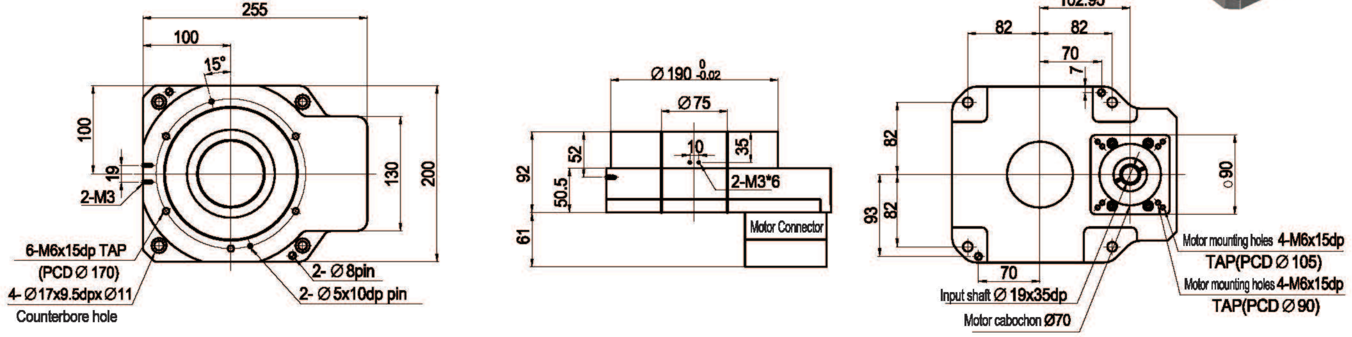
The following single rotary table sizes, Right-angle and planetary gearboxes can be connected, For specific dimensions, please consult the sales engineer





ZK275-10

The following single rotary table sizes, Right-angle and planetary gearboxes can be connected, For specific dimensions, please consult the sales engineer



RIGHT ANGLE GEARBOX

ZR

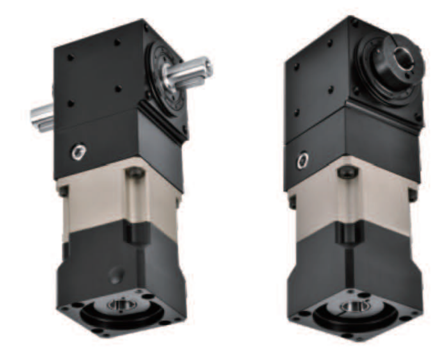
Low rotating backlash less than 10 seconds

- The right angle reducer is processed using a high precision six axial machine. It is clamped and and finished all in one process.
- Transmission gears can achieve low rotating backlash and high accuracy through precision grinding.
- Precision transmission and quiet, stable operation can realize low noise, high rigidity and other requirements.

ZR–P Solid shaft | ZR–H Hollow shaft | ZR–2P Double output shaft

Features

- The reducer body with a compact structure and small volume to save the mounting space.
- Although the reducer is small in volume and light in weight, and it features of high torque output and low backlash.
- When ordering, please inform the sizes of motor flange and shaft.



Ordering Model Indication

ZR — 042 — 3 — P

Right Angle Reducer | Specifications | Ratio | Output mode

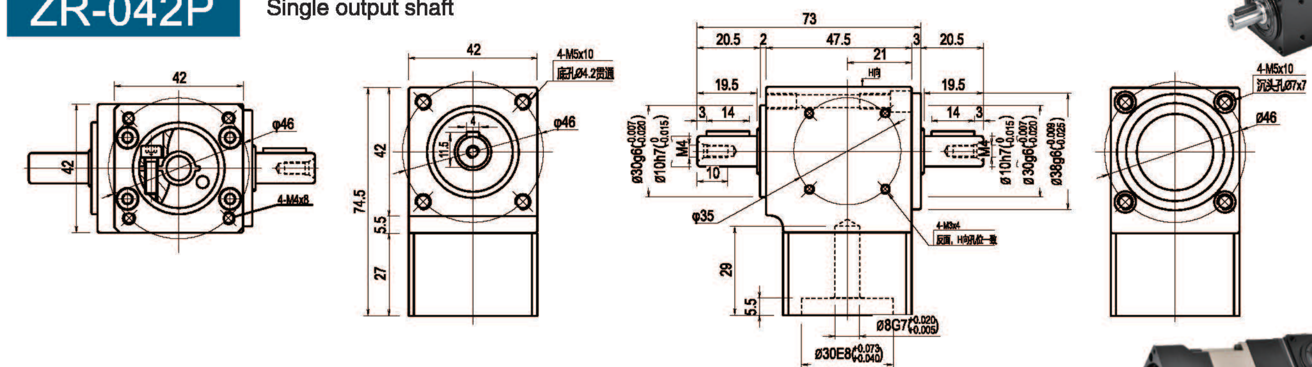
- P: Single output shaft
- 2P: Double output shaft
- H: Hole output
- S: with planetary gearbox

Specification

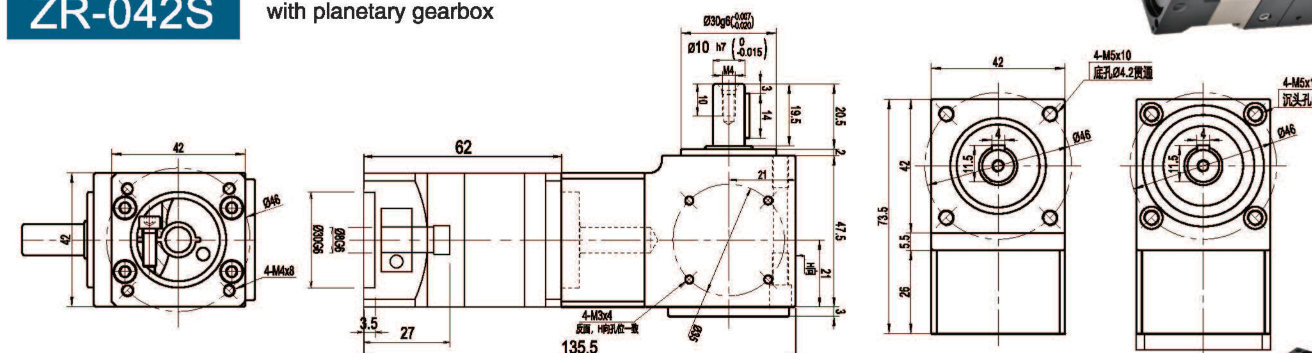
Description / Model No.	Ratio	Allowable Max Torque (kgf.m/N.m)	Breaking Torque (kgf.m/N.m)	Allowable Max Speed (rpm/min)	Backlash (min–arc)	Weight (kg)
ZR042	3	1.5/15	2.5/24	2500	0.5	0.5
ZR042S	9.12.15.21.30	1.5/15	2.5/24	2500	2	0.9

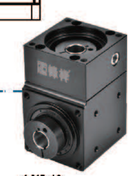
Dimensions Unit: mm

ZR-042P Single output shaft

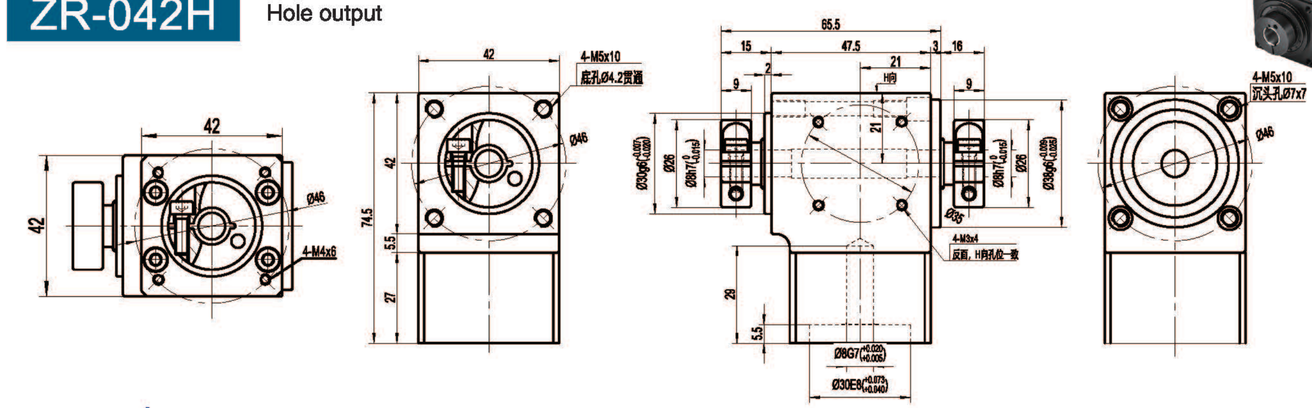


ZR-042S with planetary gearbox





ZR-042H Hole output



Ordering Model Indication

ZR — 060 — 3 — P

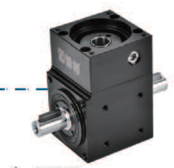
Right Angle Reducer | Specifications | Ratio | Output mode

- P: Single output shaft
- 2P: Double output shaft
- H: Hole output
- S: with planetary gearbox

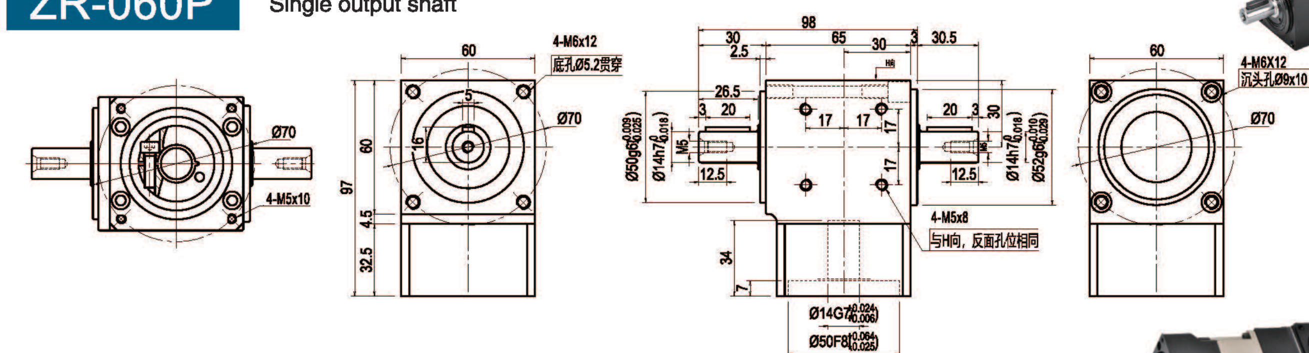
Specification

Description / Model No.	Ratio	Allowable Max Torque (kgf.m/N.m)	Breaking Torque (kgf.m/N.m)	Allowable Max Speed (rpm/min)	Backlash (min–arc)	Weight (kg)
ZR060	2 / 3	4.5/45	7.5/72	2500	0.5	1.2
ZR060S	6.8.10.14.20	4.5/45	7.5/72	2500	2	2

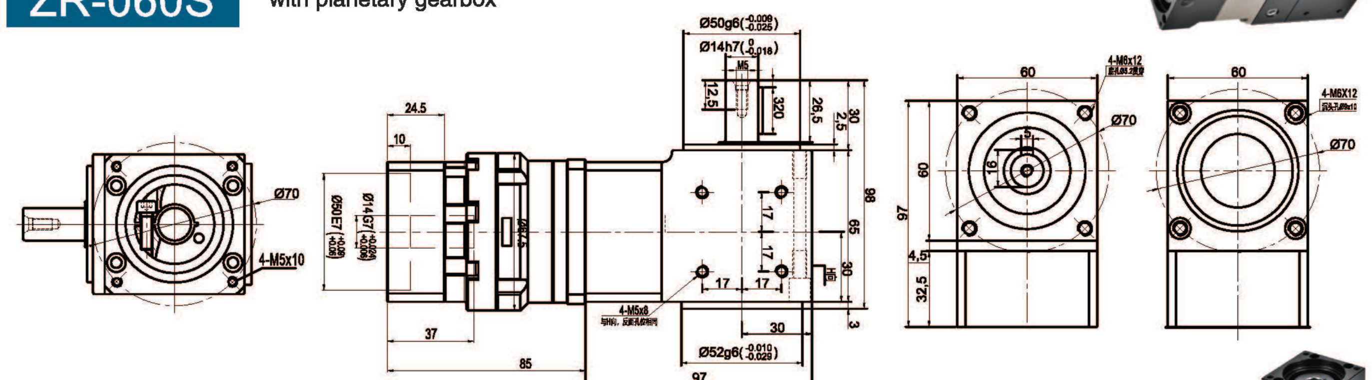
Dimensions Unit: mm

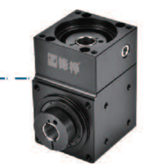


ZR-060P Single output shaft

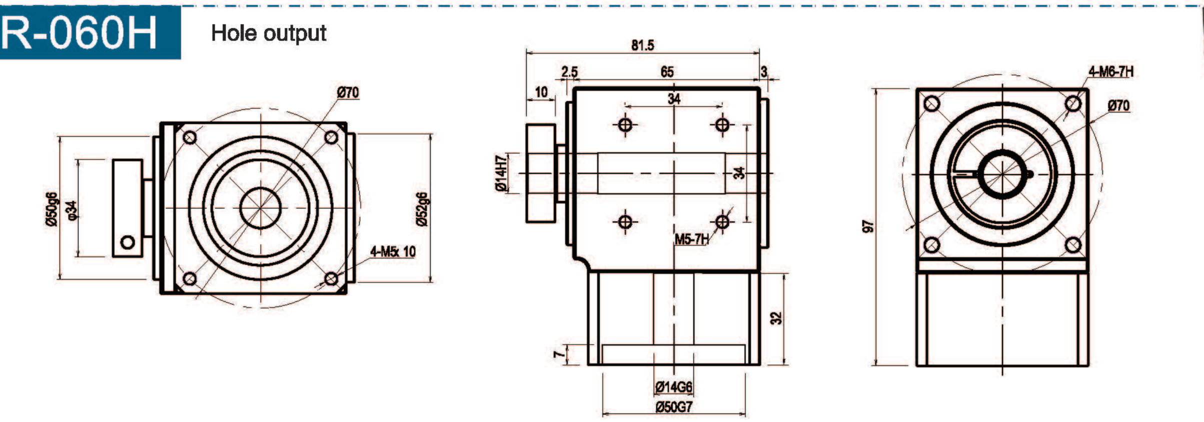


ZR-060S with planetary gearbox





ZR-060H Hole output



Ordering Model Indication

ZR — 090 — 3 — P

- ZR: Right Angle Reducer
- 090: Specifications
- 3: Ratio
- P: Output mode

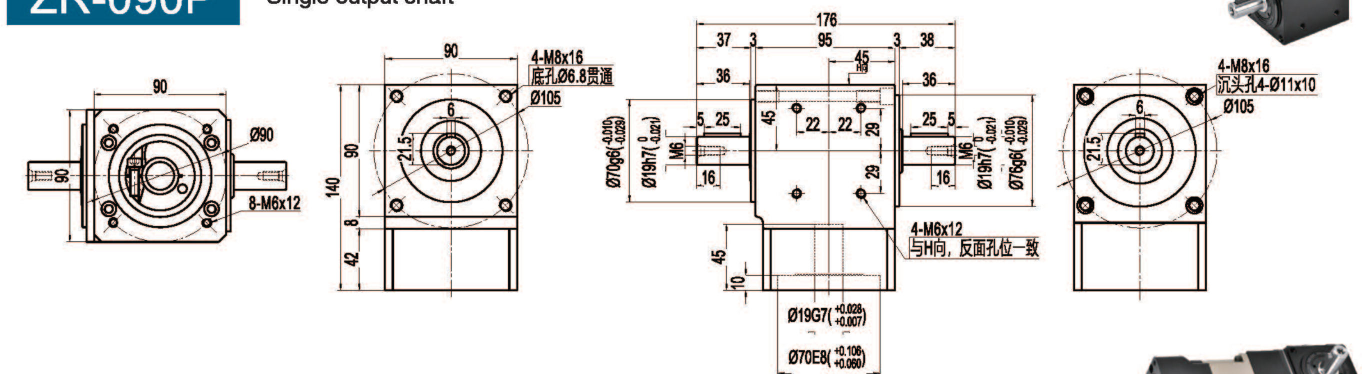
P: Single output shaft
2P: Double output shaft
H: Hole output
S: with planetary gearbox

Specification

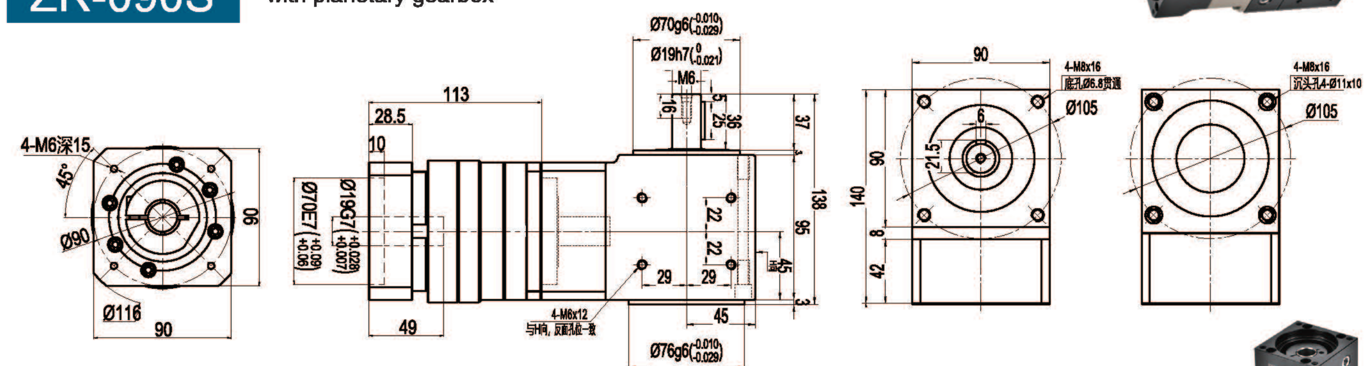
Model No. \ Description	Ratio	Allowable Max Torque (kgf.m/N.m)	Breaking Torque (kgf.m/N.m)	Allowable Max Speed (rpm/min)	Backlash (min–arc)	Weight (kg)
ZR090	2 / 3	12/120	18/180	2500	0.5	3.6
ZR090S	6.8.10.14.20	12/120	18/180	2500	2	6.5

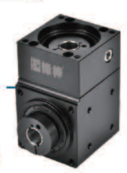
Dimensions Unit: mm

ZR-090P Single output shaft

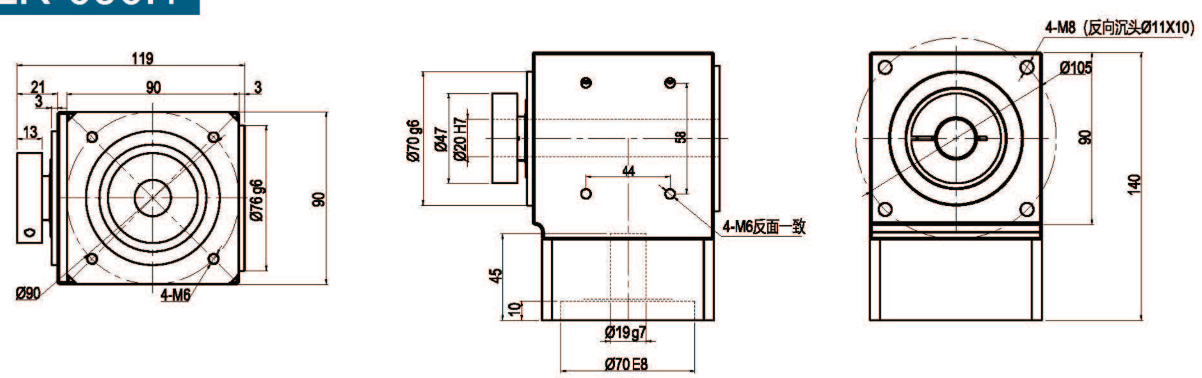


ZR-090S with planetary gearbox





ZR-090H Hole output



Ordering Model Indication

ZR — 120 — 3 — P

- ZR: Right Angle Reducer
- 120: Specifications
- 3: Ratio
- P: Output mode

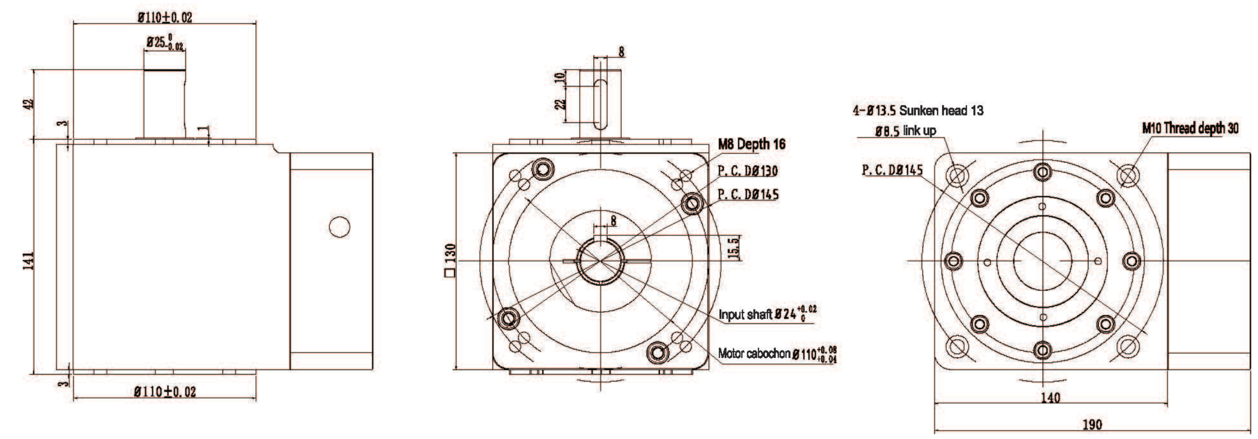
P: Single output shaft
2P: Double output shaft
H: Hole output
S: with planetary gearbox

Specification

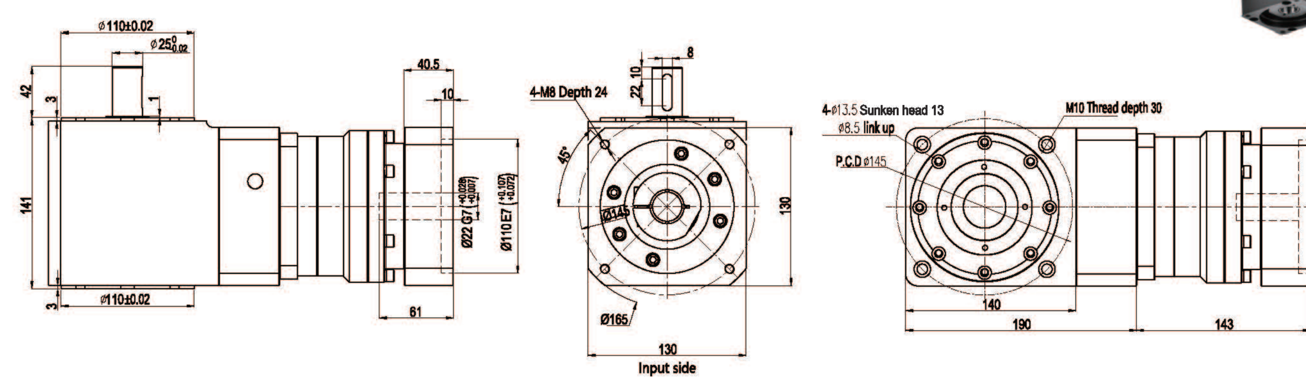
Model No. \ Description	Ratio	Allowable Max Torque (kgf.m/N.m)	Breaking Torque (kgf.m/N.m)	Allowable Max Speed (rpm/min)	Backlash (min–arc)	Weight (kg)
ZR120	2	16/160	36/345	2500	0.5	8
ZR120S	6.8.10.14.20	16/160	36/345	2500	2	15.5

Dimensions Unit: mm

ZR-120P Single output shaft



ZR-120S with planetary gearbox

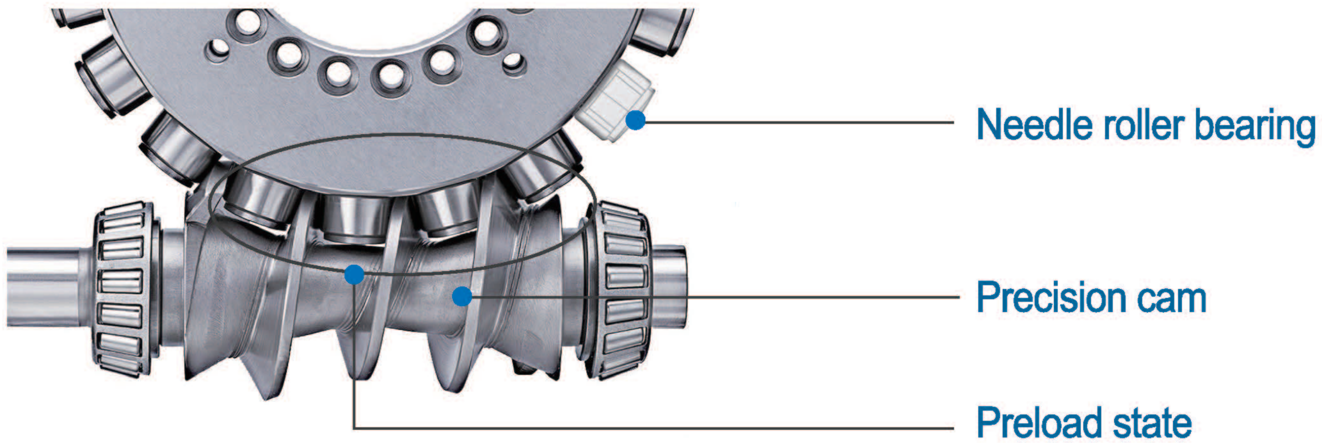


Precision Heavy Duty Hollow Rotary Table Series

Large hollow High rigidity

High precision

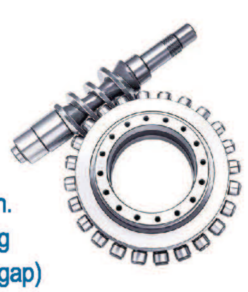
Cam roller mechanism features

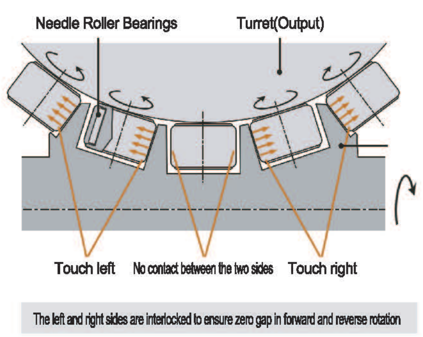


Preload state diagram

Zero clearance High precision

- The cam curve and needle bearing mesh perfectly;
- The mechanism is always in preload state to eliminate backlash. Even if the direction is rotated during processing, the processing surface can be perfectly processed (forward and reverse, zero gap)





Ordering Model Indication

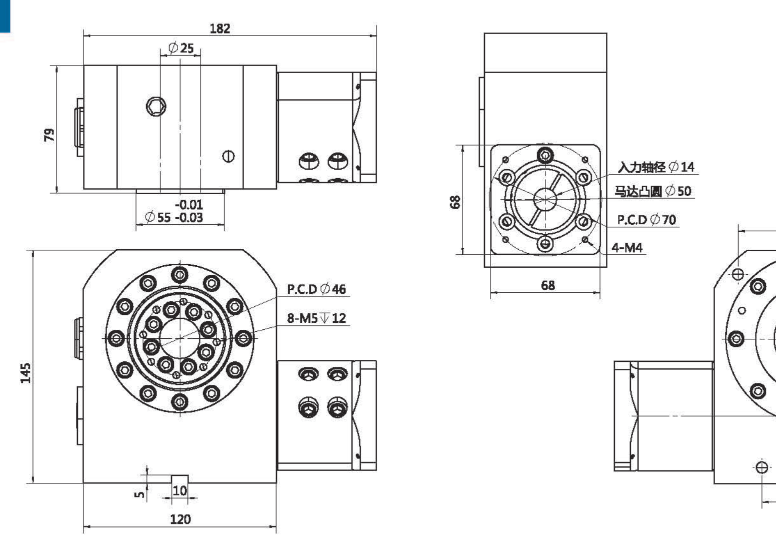
DK	70	20	F
DK Series	Specification and model DK50 DK120 DK70 DK220 DK85 DK320 DK90 DK420	Ratio 15 / 20 / 24 / 40 / 60 If the speed ratio is not enough, you can add a planetary reduction ratio. Please consult for details.	Motor Type F: Connect to planetary reducer S: Servo motor B: Stepper motor

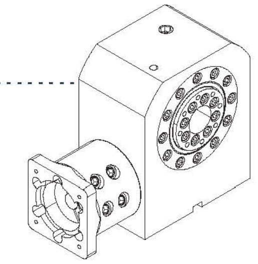
Technical Parameter

Model	DK50-15
Rotating platform bearings	Crossed roller bearings
Reduction ratio (i)	1:15(excluding reducer)
Radial load(kgf)	30
Working disc diameter (mm)	Φ55
Minimum segmentation angle (deg)	0.001
Repeatability (arc-sec)	8
Adaptive motor	60 frame servo
Center height(mm)	90
Motor(W)	400
Center hole diameter (mm)	Φ25
Segmentation accuracy (sec)	±25
Precision life (hr)	20000(intermittent operation)

External Dimensions

DK50-15





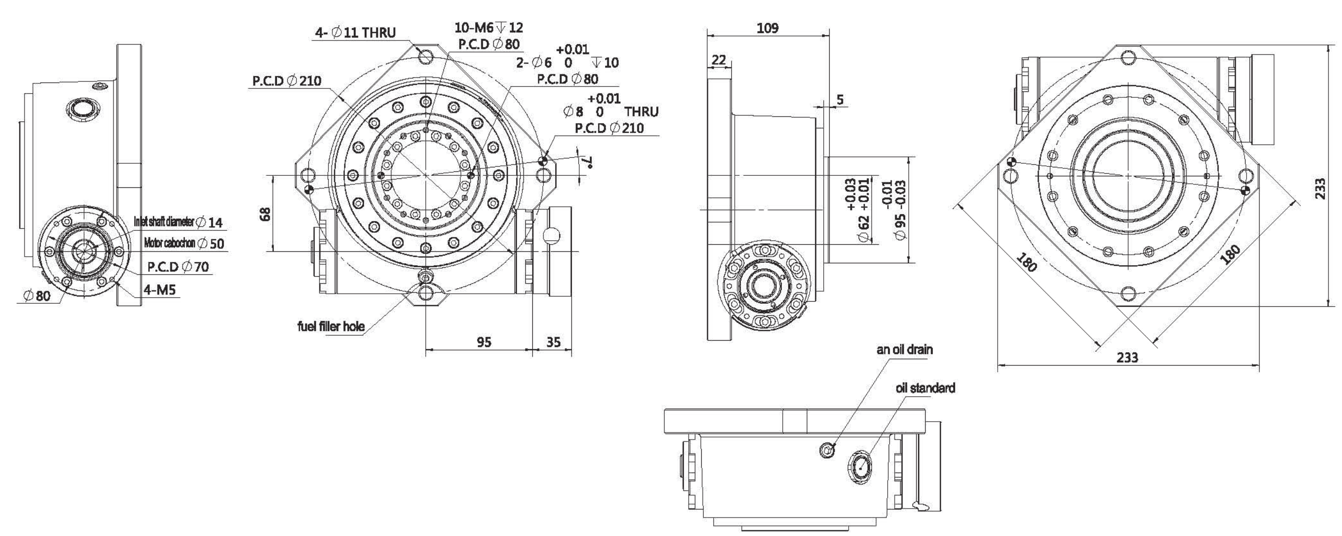
* Tips: The recommended maximum diameter of the rotating tooling plate is 400mm and the load-bearing capacity is 30kg.

Technical Parameter

Model	DK70-20	DK85-24	DK90-20	DK120-20	DK220-40	DK320-60	DK420-60
Rotating platform bearings	Crossed roller bearings	Crossed roller bearings	Crossed roller bearings	Crossed roller bearings	Crossed roller bearings	Crossed roller bearings	Crossed roller bearings
Reduction ratio (i)	1: 20 (Excluding reducer)	1: 24 (Excluding reducer)	1: 20 (Excluding reducer)	1: 20 (Excluding reducer)	1: 40 (Excluding reducer)	1: 60 (Excluding reducer)	1: 60 (Excluding reducer)
Tipping moment (N.m)	400	584	625	1028	3749	13354	30000
Radial load (T)	/	/	/	/	1.9	2.5	4.5
Allowable input torque (N.m)	≤30	≤68	≤72	≤90	/	/	/
Allowable input speed (r/min)	<1000	<1000	<1000	<1000	<800	<800	<800
Repeatability (arc-sec)	±15	±15	±15	±15	±15	±15	±15
Positioning accuracy (arc-sec)	±30	±30	±30	±30	±30	±30	±30
Adaptive motor	60 frame servo	80 frame servo	80 frame servo	130 frame servo	130 frame servo	180 frame servo	180 frame servo
Motor Type	Planetary Reducer Servo Motor	Planetary Reducer Servo Motor	Planetary Reducer Servo Motor	Planetary Reducer Servo Motor	Planetary Reducer Servo Motor	Planetary Reducer Servo Motor	Planetary Reducer Servo Motor
Allowable vertical pressure (N)	/	/	/	/	18000	28000	60000
Allowable moment of inertia load(N.m)	75	200	220	250	/	/	/
Parallelism of rotary stage(mm)	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Concentricity of rotary stage(mm)	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Accuracy life(hr)	20000(Intermittent operation)	20000(Intermittent operation)	20000(Intermittent operation)	20000(Intermittent operation)	20000(Intermittent operation)	20000(Intermittent operation)	20000(Intermittent operation)
Protection class(IP)	40	40	40	40	40	40	40

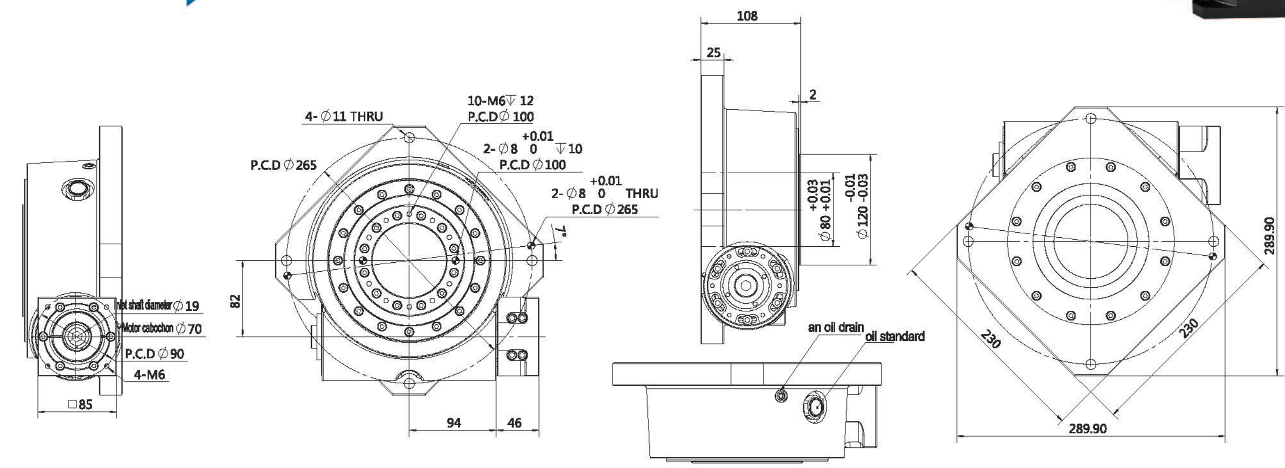
External Dimensions

DK70-20



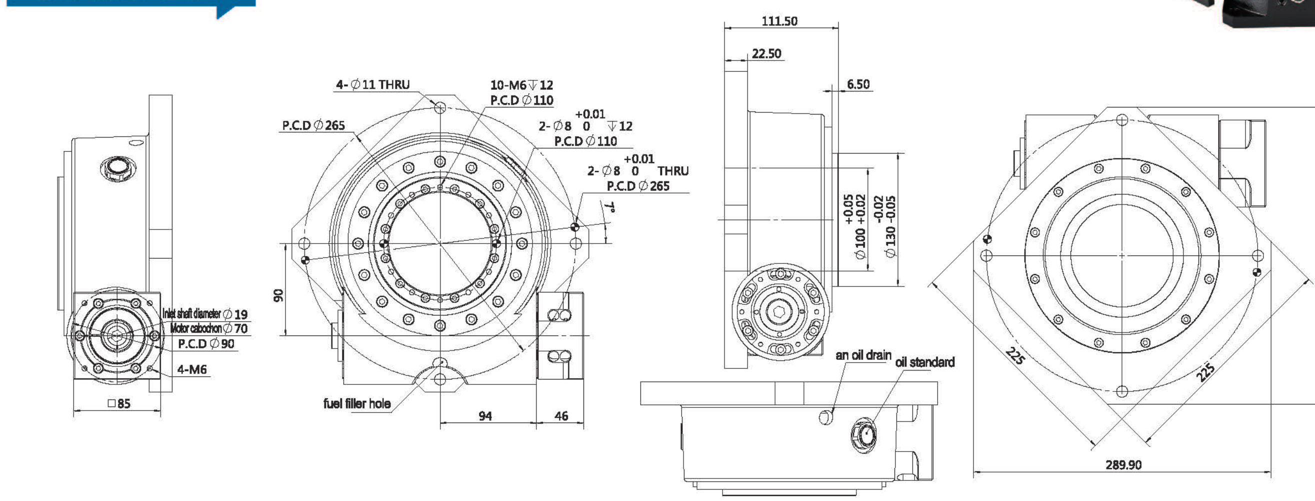
* Tips: The recommended maximum diameter of the rotating tooling plate is 500mm and the load-bearing capacity is 80kg.

DK85-24



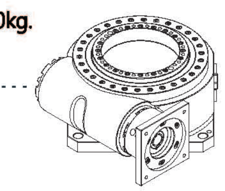
* Tips: The recommended maximum diameter of the rotating tooling plate is 600mm and the load-bearing capacity is 200kg.

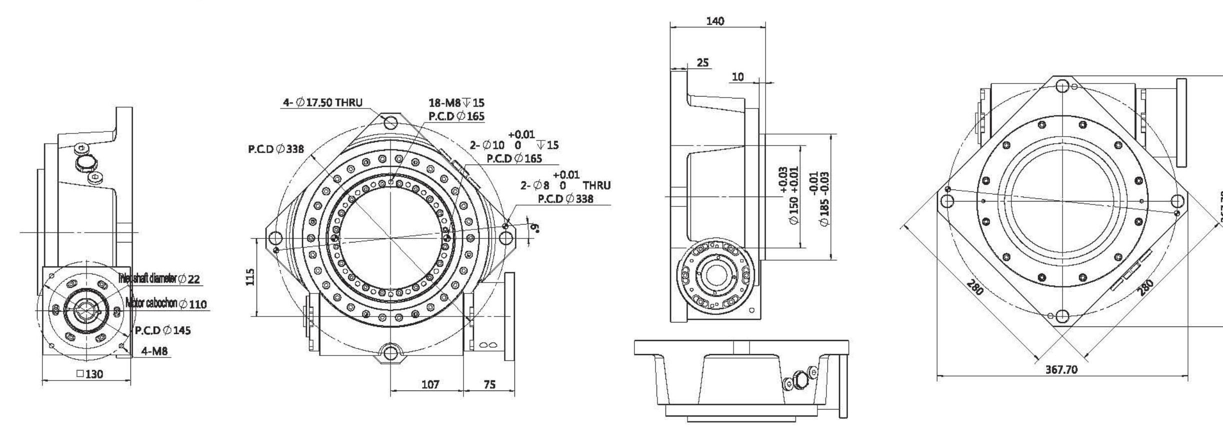
DK90-20



* Tips: The recommended maximum diameter of the rotating tooling plate is 600mm and the load-bearing capacity is 260kg.

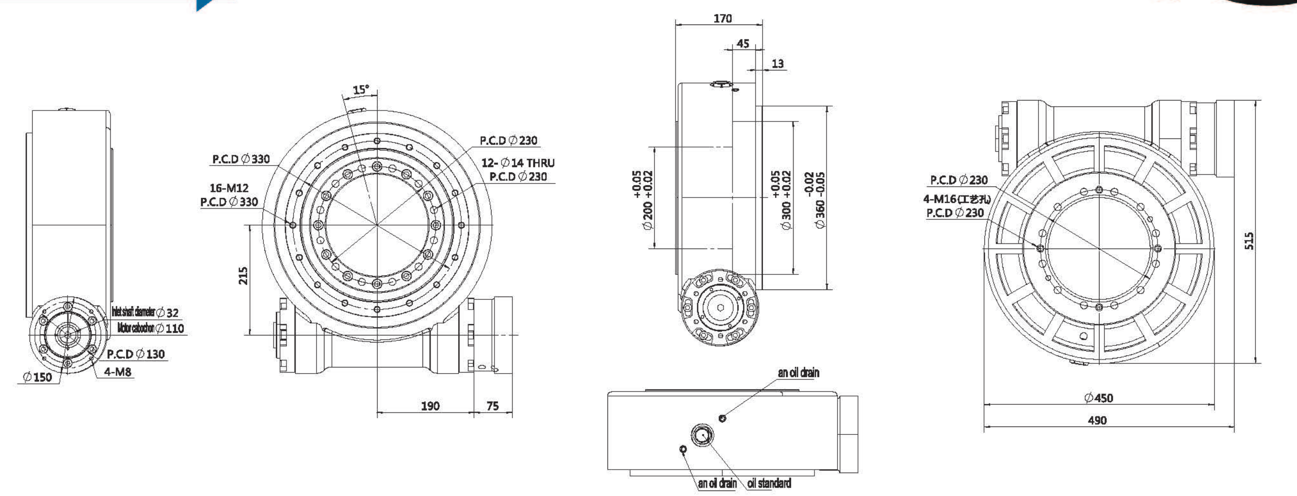
DK120-20





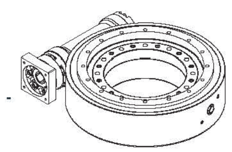
* Tips: The recommended maximum diameter of the rotating tooling plate is 800mm and the load-bearing capacity is 500kg.

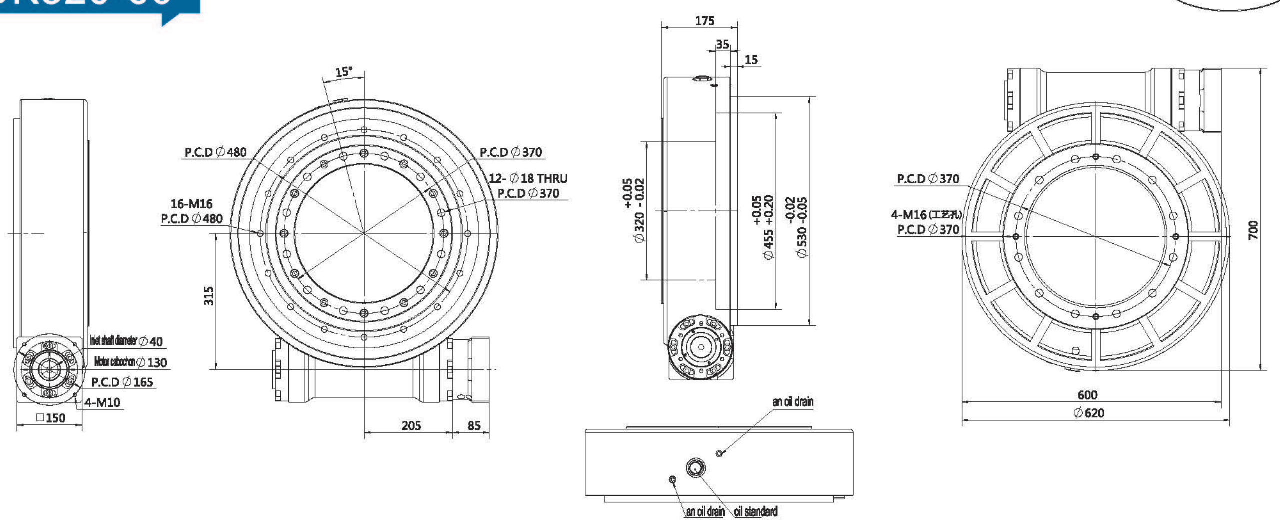
DK220-40



* Tips: The recommended maximum diameter of the rotating tooling plate is 1300mm and the load-bearing capacity is 1500kg.

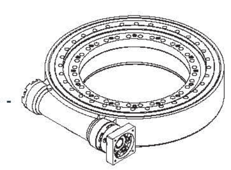
DK320-60

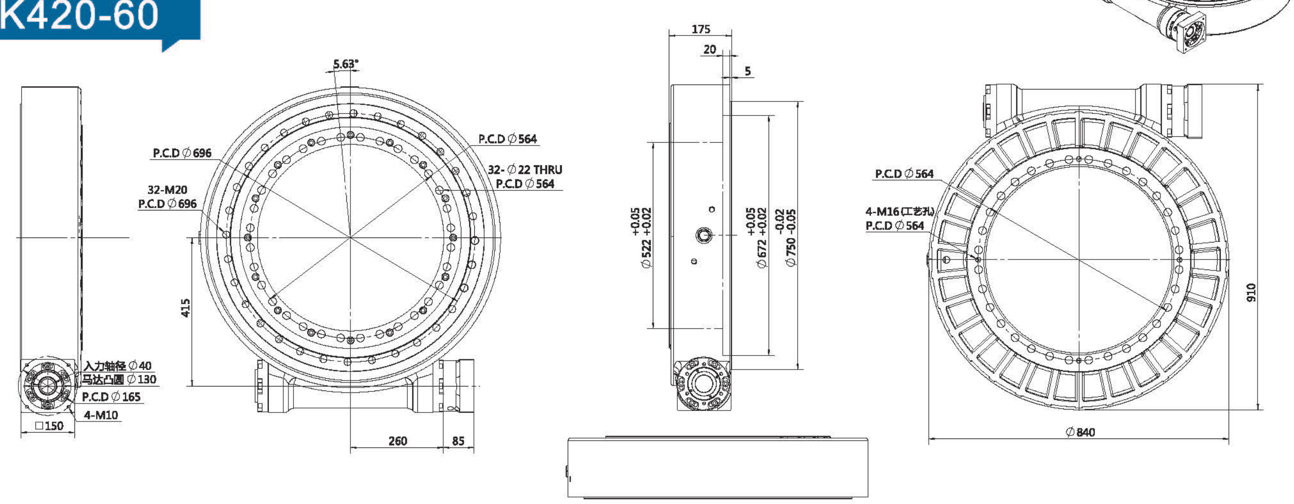




* Tips: The recommended maximum diameter of the rotating tooling plate is 1400mm and the load-bearing capacity is 2500kg.

DK420-60

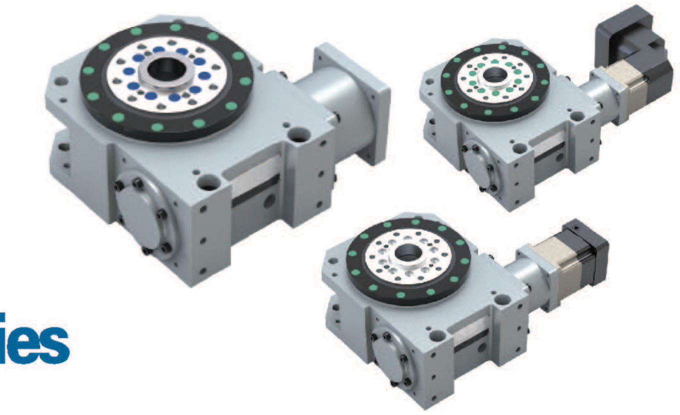




* Tips: The recommended maximum diameter of the rotating tooling plate is 1900mm and the load-bearing capacity is 4500kg.

DKH Series

Precision Heavy Duty Hollow Rotary Table Series



Ordering Model Indication

DKH M - 50 R - 15 (14 J 5 - 30 - 50 - 70 - M5)

DKH

Code/Meaning:

No. Without planetary reducer

M: With direct-connected planetary reducer

R: With angle planetary reducer

Axis spacing or code

Reduction ratio

Input Flange Direction: (1)*

L : Left side

R : Right side

Motor shaft * diameter (2-A)

key

key width

Motor shaft length* (2-C)

Motor can* (2-B)

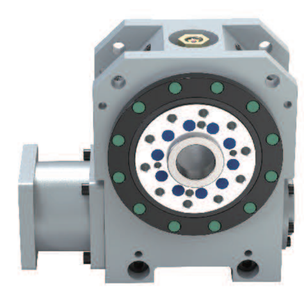
Mounting holes P.C.D* (2-E)

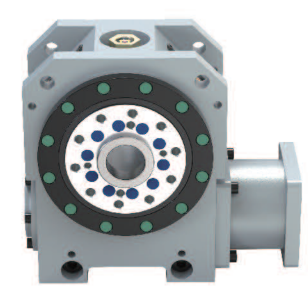
Mounting screw* (2-F)

* Mark: Please refer to the figure below

Cam roller indexing table type D input flange direction

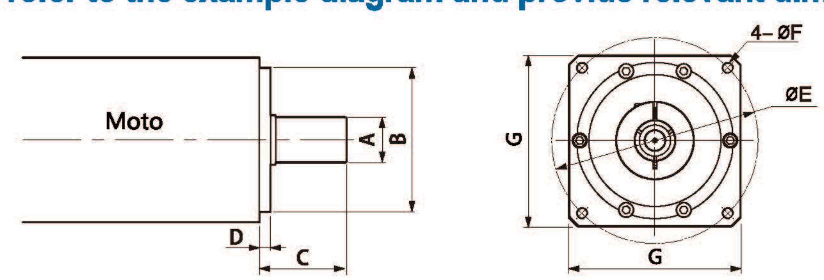
DKH-L





DKH-R

The motor can refer to the example diagram and provide relevant dimensions



• When ordering, please provide the following information to facilitate order processing

A	B	C	D	E	F	G

Selection parameter comparison table

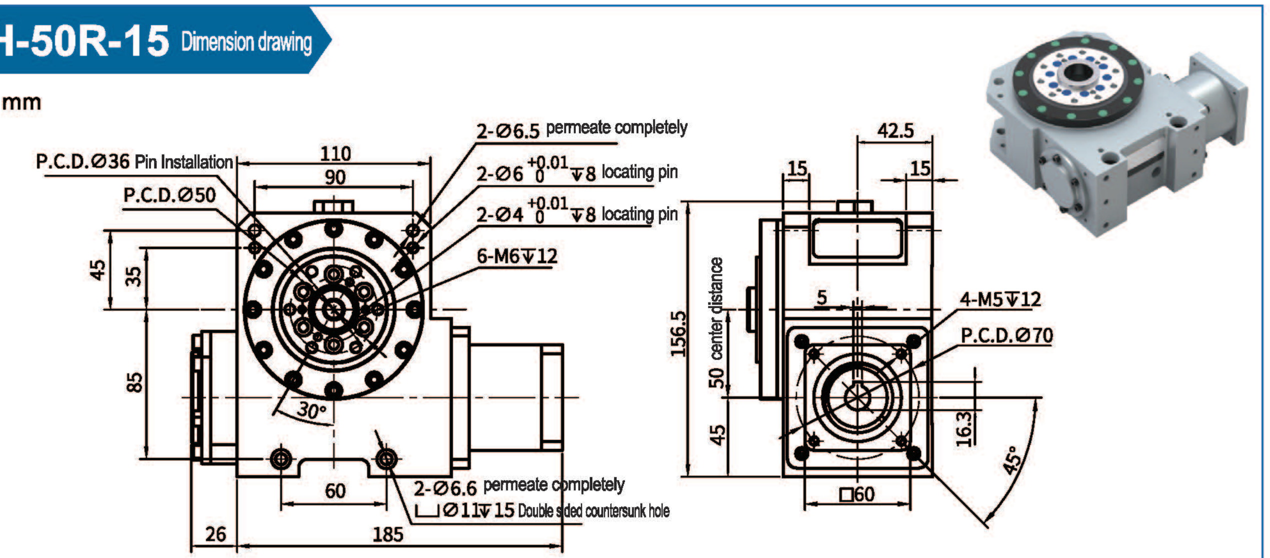
Model	DKH50	DKH70	DKH90	DKH120	DKH150	DKH220	DKH365
Ratio	15	20	20	30	30	40	60
Recommended disc dia	600	900	1200	1500	2000	2500	3000
Recommended load	50KG	150KG	300KG	600KG	1200KG	2500KG	6000KG
With reducer	60	60/90	90/115	90/115	90/115	115/142	115/142
Servo motor	0.2/0.4	0.4/0.75	0.75/1.0	0.75/1.0/1.3	1.3/1.8	1.3/1.8	1.3/1.8
Speed	Avoid to choose ratio 1:3						

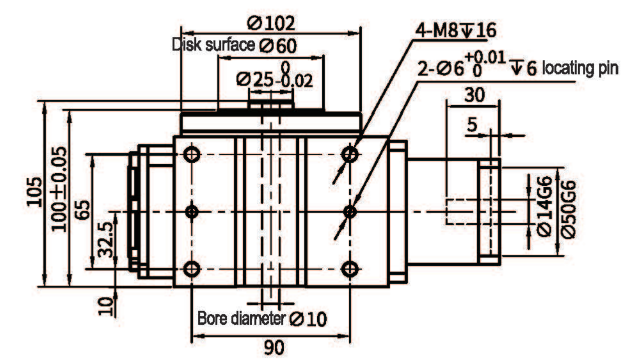
DKH Performance data

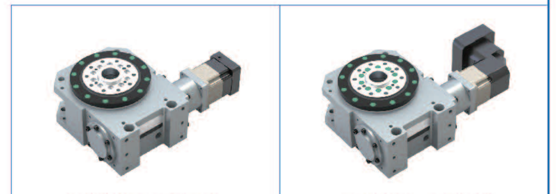
Specification		DKH-50R-15 DKHM-50R-i DKHR-50R-i	DKH-70R-20 DKHM-70R-i DKHR-70R-i	DKH-90R-20 DKHM-90R-i DKHR-90R-i	DKH-120R-30 DKHM-120R-i DKHR-120R-i	DKH-150R-30 DKHM-150R-i DKHR-150R-i	DKH-220R-40 DKHM-220R-i DKHR-220R-i	DKH-365R-60 DKHM-365R-i DKHR-365R-i	DKH-445R-72 DKHM-445R-i DKHR-445R-i	DKH-575R-90 DKHM-575R-i DKHR-575R-i
Ratio	Single platform	15	20	20	30	30	40	60	72	90
	With straight planetary reducer	45~150	60~200	60~200	90~300	90~300	120~400	180~600	126~720	270~900
	With angle planetary reducer	45~300	60~400	60~400	90~600	90~600	120~800	180~1200	216~1440	270~1800
Adaptive motor		Servo motor + planetary								
Adaptive servo motor power KW		0.85/1.3/1.8	0.75/1.0	0.75/1.0	3.0/4.0/5.0	1.0/1.5/2.0	3.0/4.0/5.0	2.9/4.4	2.9/4.4	2.9/4.4
Allowable disk speed r/min		<70	<50	<75	<50	<50	<40	<25	<20	<16
Allowable load torque N.m		156	286	954	2276	2538	4480	13384	21356	46930
Allowable overturning moment N.m		109	200	668	1593	1777	3136	9369	14949	32851
Allowable axial load dynamic N		3460	4020	15270	25290	27690	56000	143400	168600	197600
Allowable radial load dynamic N		2455	2650	12435	16980	21120	37723	88203	103770	113002
Moment of inertia $kg.m^2$		$9.46X10^{-4}$	$43.73x10^{-4}$	$195.85x10^{-4}$	0.08	0.24	0.85	7.97	31.66	102.53
Graduation accuracy arcsec		±15	±20	±20	±20	±20	±20	±20	±20	±20
Repeatability arcsec		±5(0.0013°)	±10(0.0026°)	±10(0.0026°)	±10(0.0026°)	±10(0.0026°)	±10(0.0026°)	±10(0.0026°)	±5(0.0013°)	±5(0.0013°)
Parallelism of rotating table (mm)		±0.005	±0.005	±0.005	±0.005	±0.005	±0.005	±0.005	±0.005	±0.005
Concentricity of rotating table (mm)		±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01
Service life hr		20000	20000	20000	20000	20000	20000	20000	20000	20000
Protection level		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
Weight (excluding motor) kg		9.5	12	39	65	85	195	490	910	1485

DKH-50R-15 Dimension drawing

Unit: mm





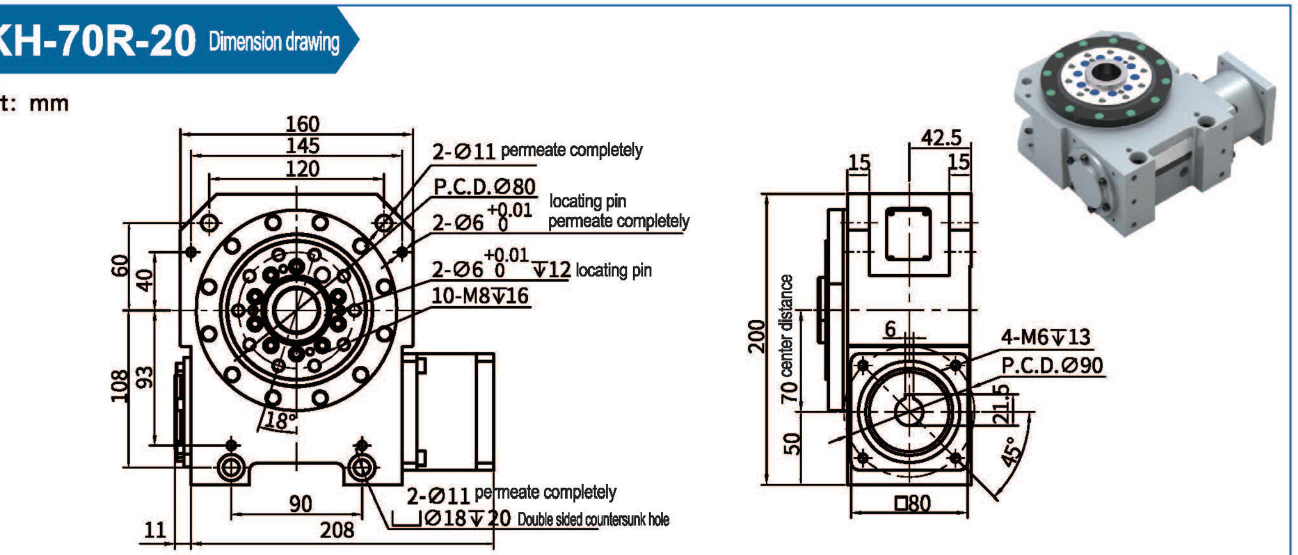


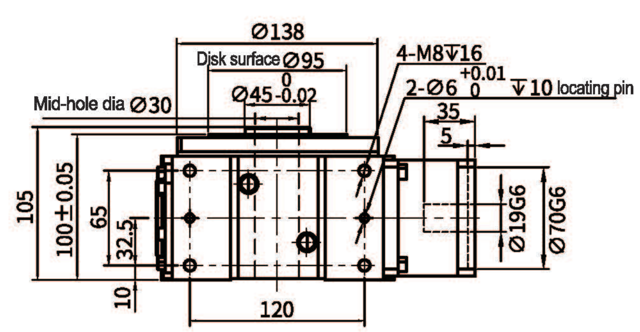
DKHM-50R-i DKHR-50R-i

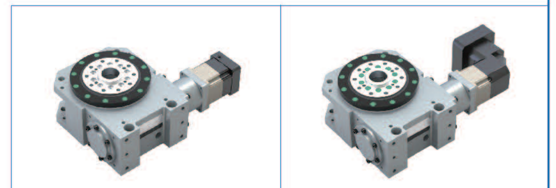
* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

DKH-70R-20 Dimension drawing

Unit: mm







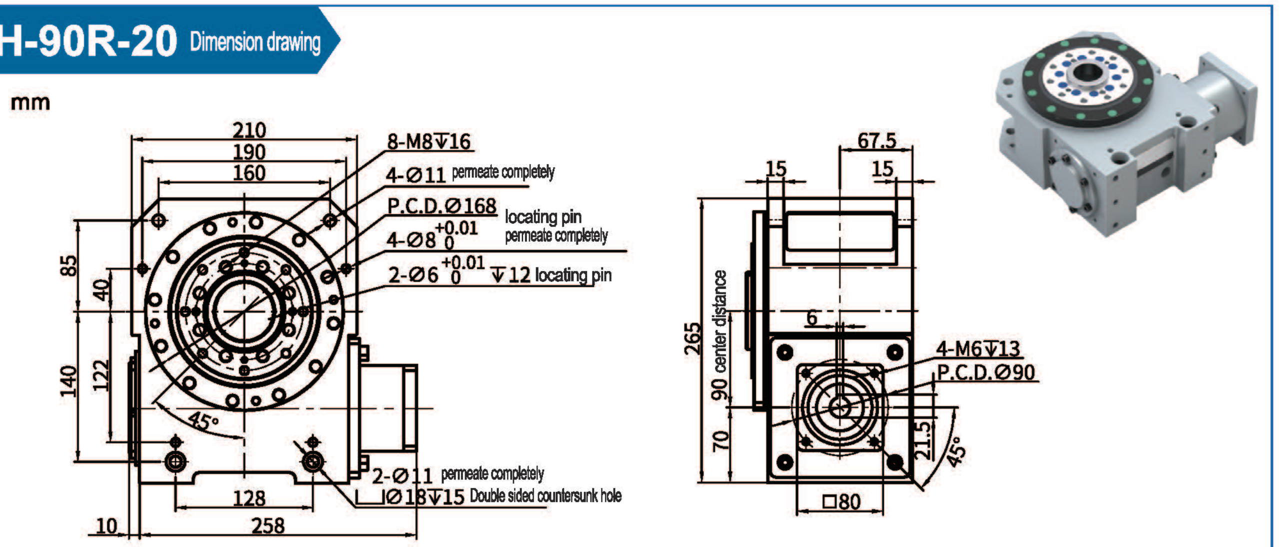
DKHM-70R-i DKHR-70R-i

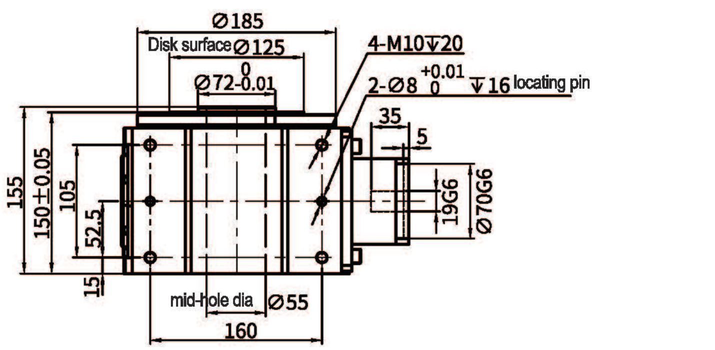
* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

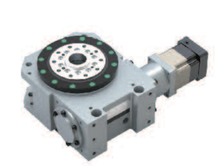
* The above drawings are for standard installation methods and input flange dimensions. Please contact us if other installation methods and input flange dimensions are required.

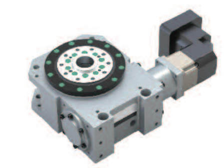
DKH-90R-20 Dimension drawing

Unit: mm





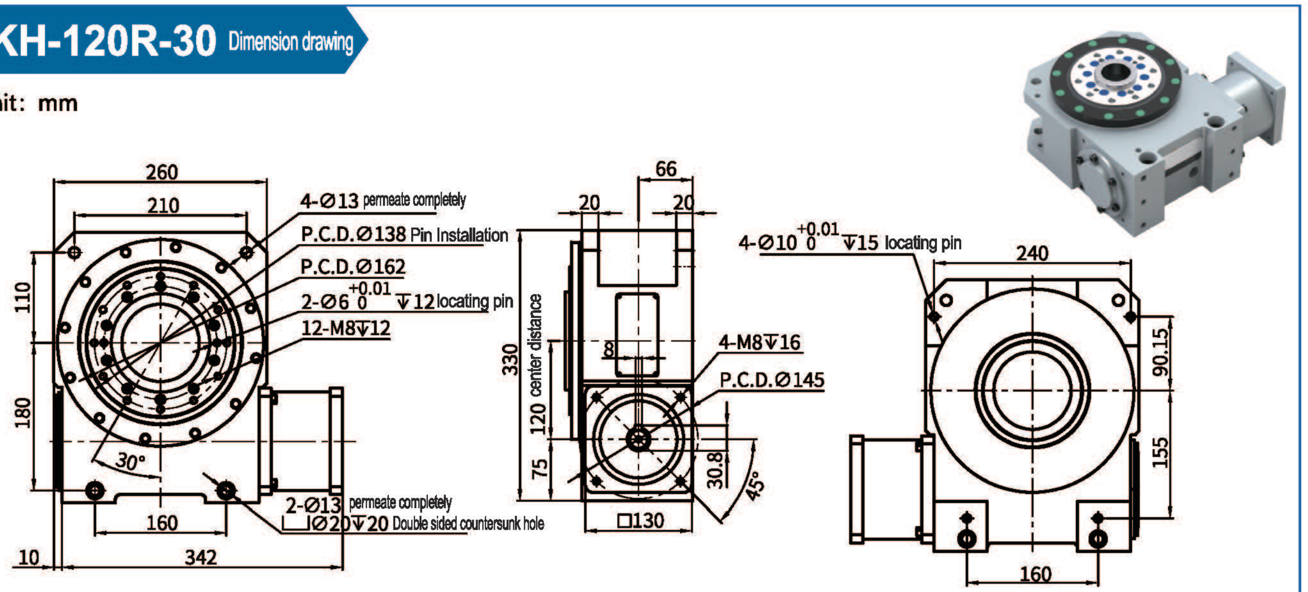

DKHM-90R-i

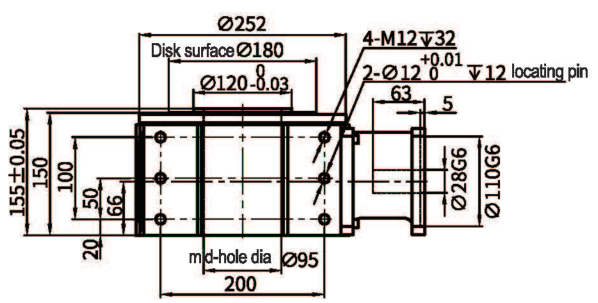

DKHR-90R-i

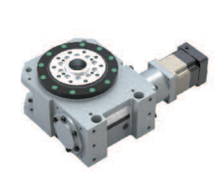
* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

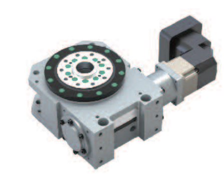
DKH-120R-30 Dimension drawing

Unit: mm






DKHM-120R-i

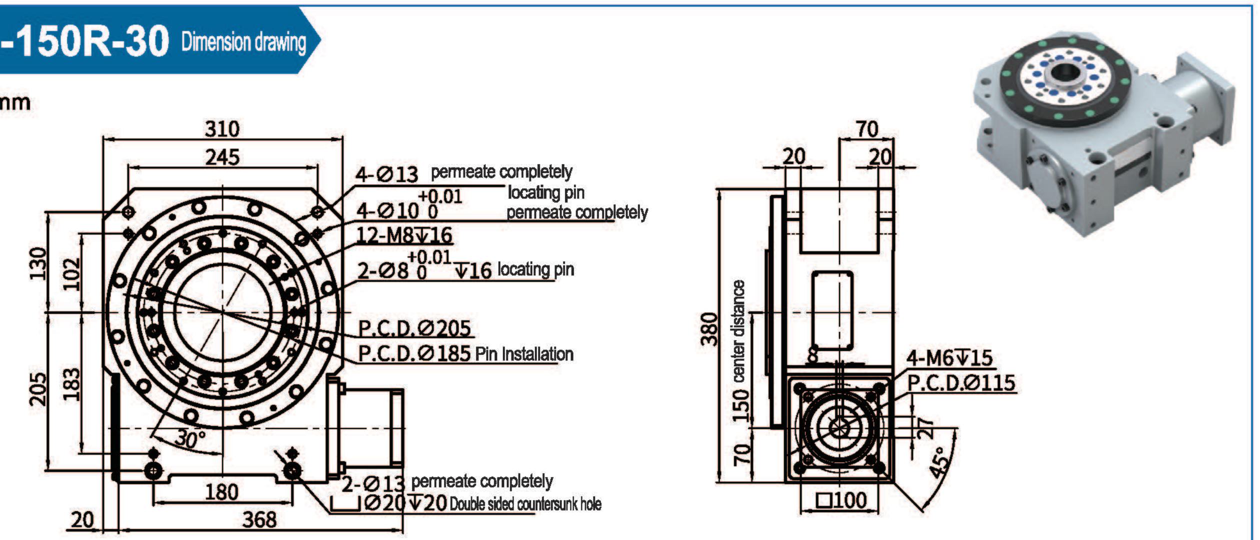

DKHR-120R-i

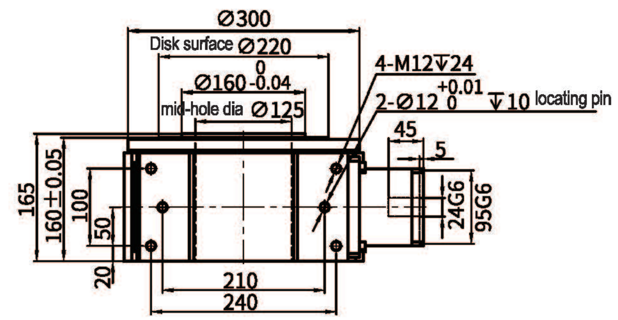
* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

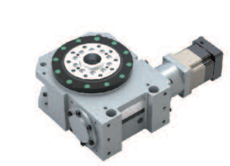
* The above drawings are for standard installation methods and input flange dimensions.
Please contact us if other installation methods and input flange dimensions are required.

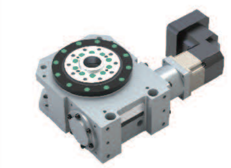
DKH-150R-30 Dimension drawing

Unit: mm





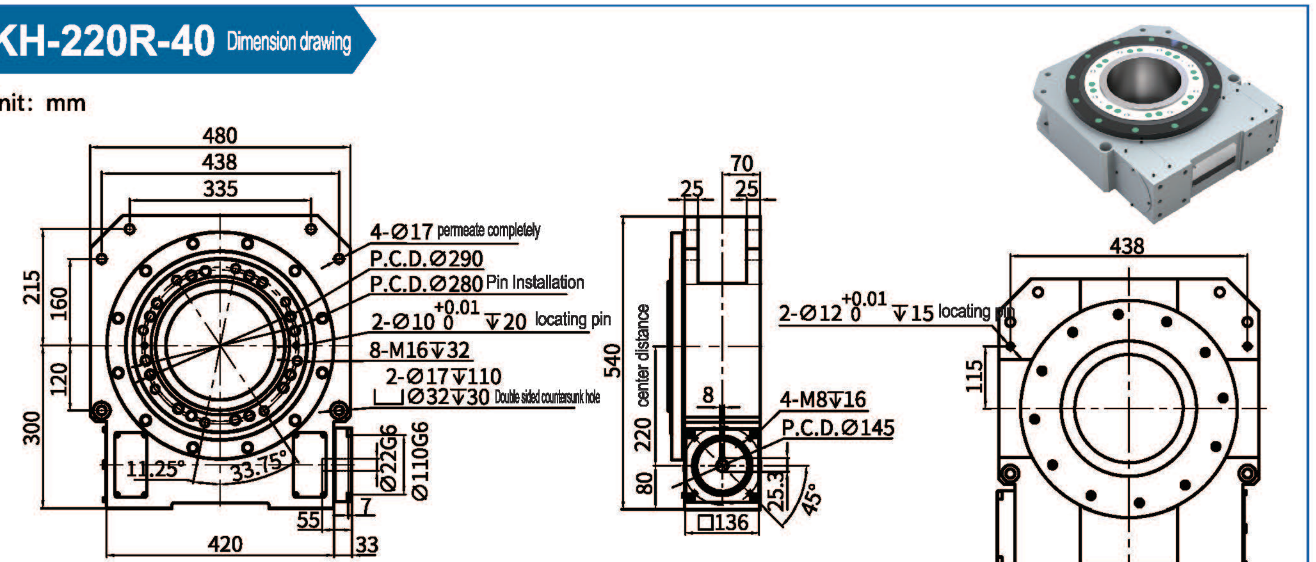

DKHM-150R-i

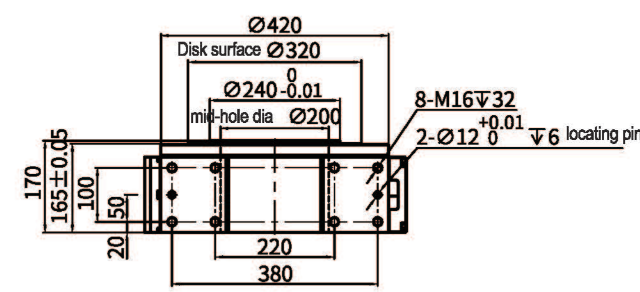

DKHR-150R-i

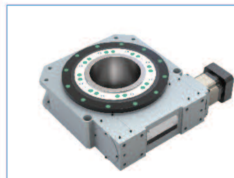
* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

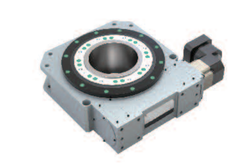
DKH-220R-40 Dimension drawing

Unit: mm






DKHM-220R-i

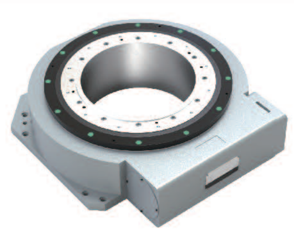

DKHR-220R-i

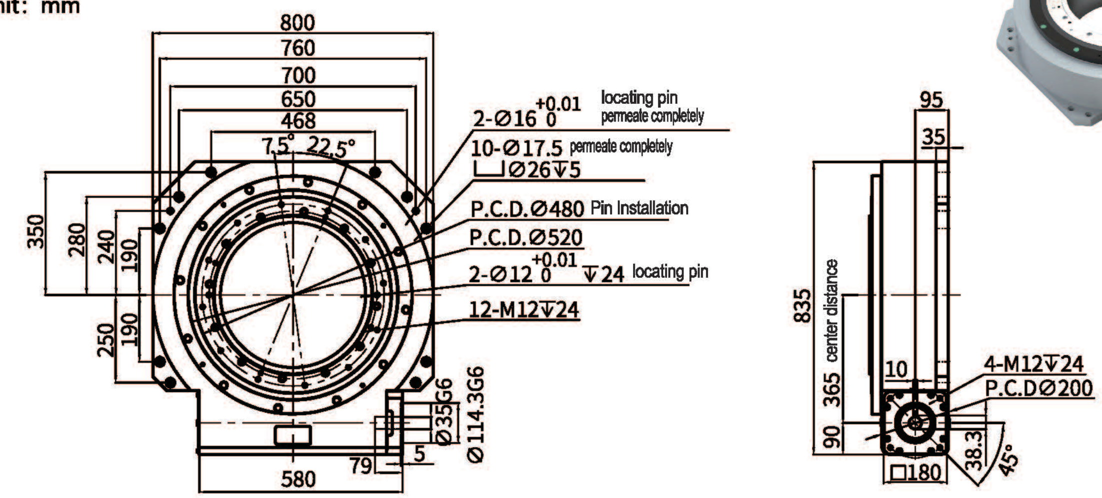
* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

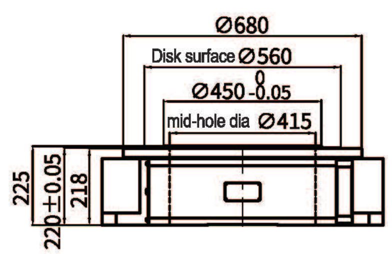
* The above drawings are for standard installation methods and input flange dimensions.
Please contact us if other installation methods and input flange dimensions are required.

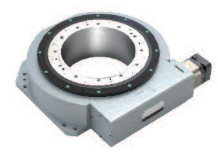
DKH-365R-60 Dimension drawing

Unit: mm

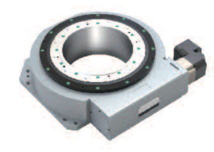








DKHM-365R-i

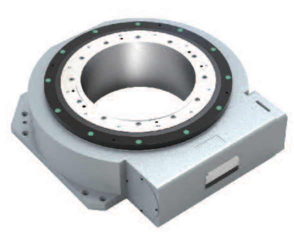


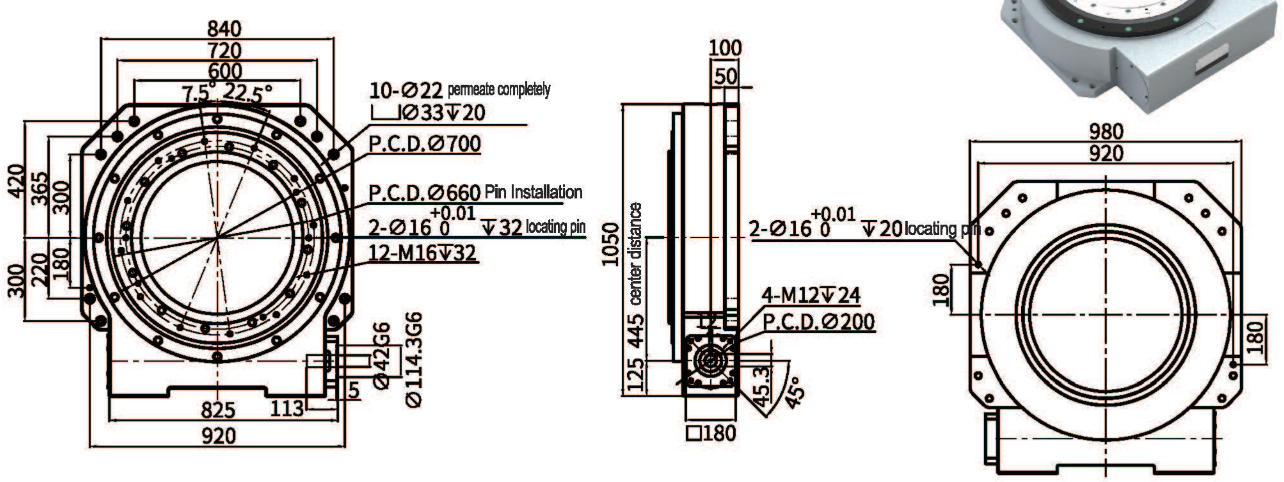
DKHR-365R-i

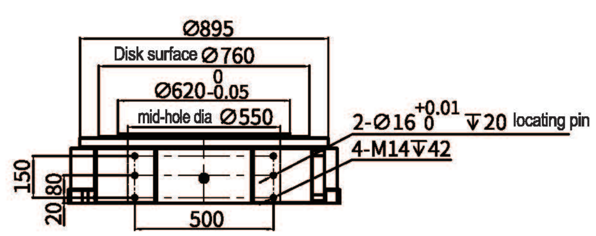
* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

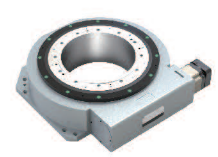
DKH-445R-72 Dimension drawing

Unit: mm

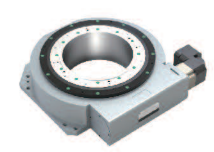








DKHM-445R-i



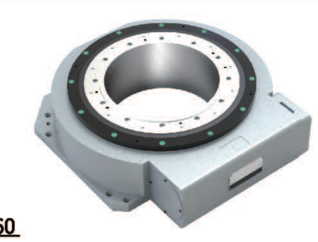
DKHR-445R-i

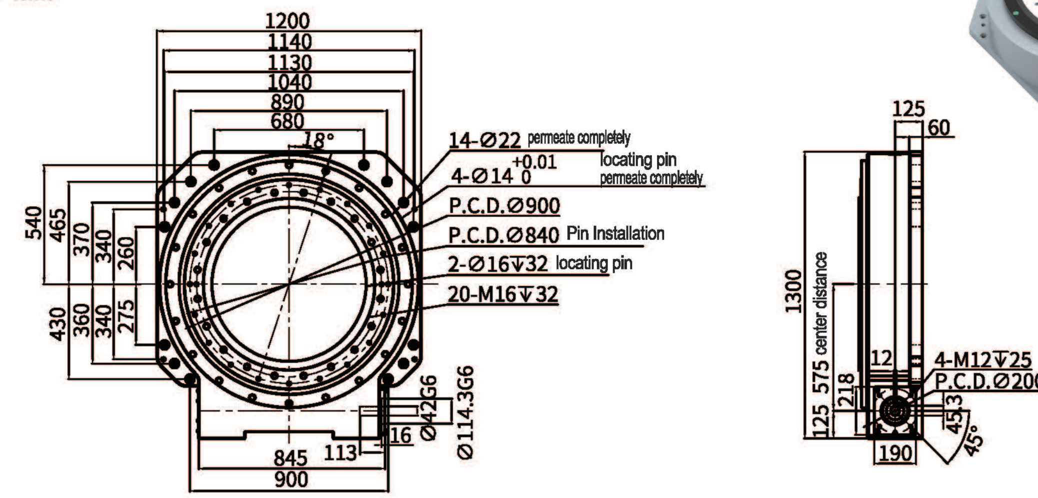
* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

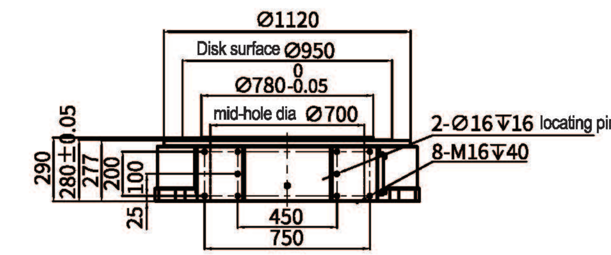
* The above drawings are for standard installation methods and input flange dimensions.
Please contact us if other installation methods and input flange dimensions are required.

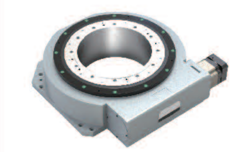
DKH-575R-90 Dimension drawing

Unit: mm

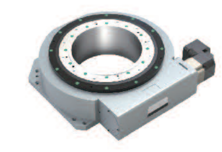








DKHM-575R-i

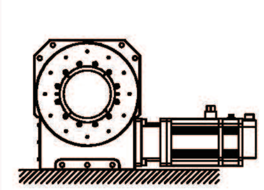
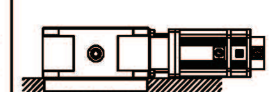
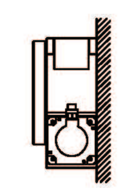
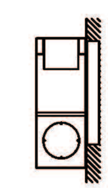


DKHR-575R-i

* The turntable can be connected to a direct-connected or angle planetary reducer to increase the speed ratio and torque. The installation size of the turntable remains unchanged, but the size of the reducer will be increased. Please consult the sales engineer for specific parameters and drawings.

* The above drawings are for standard installation methods and input flange dimensions.
Please contact us if other installation methods and input flange dimensions are required.

Precision hollow rotary indexing table installation

				
Z-Side mounting	D-Horizontal mounting	U-Ceiling Installation	BD-Wall Mount Base Installation	BP-Wall-mounted top surface installation

RT Series

Precision Hai Bo tooth hollow rotary platform

Ordering Model Indication

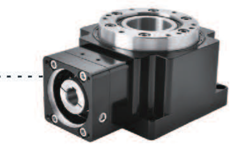
RT - 110 - 30 - K - N

Code	Model Specification	Ratio	Structural form	Motor Specification
RT	110	10	K	N: PCD70 M4 / PCD90 M6
	150	30		N1: PCD70 M5
		50		N2: PCD70 M4
		70		

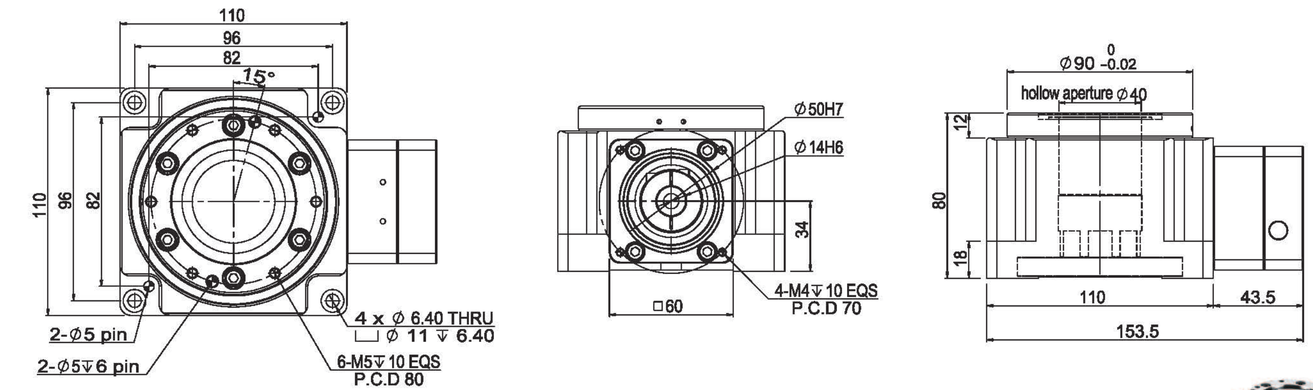
Technical Parameter

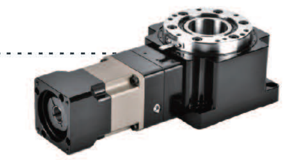
Model	Unit	RT110-10-N	RT110-K-(30/50/70)-N	RT150-10-N	RT150-K-(30/50/70)-N
Matching motor specifications	W	400	400	750	750
Rotating platform bearings		/	/	/	/
Permissible torque	N.M	45	45	80	80
Allowable moment of inertia	N.M	50	50	90	90
Allowable disk speed	rpm	200	200	200	200
Ratio	i	10	30/50/70	10	30/50/70
Repeat positioning accuracy	arc-sec	±5	±5	±5	±5
Positioning accuracy	arc-min	±0.5	±1	±0.5	±1
Precision life	h	30000	30000	30000	30000
Allowable axial load	N	2000	2000	2000	2000
Rotational plane amplitude	mm	±0.005	±0.005	±0.005	±0.005
Rotational concentricity	mm	±0.005	±0.005	±0.005	±0.005
Protection level	IP	50	50	50	50
Operating temperature	(°)	-20℃-90℃	-20℃-90℃	-20℃-90℃	-20℃-90℃
Weight	kg	3	4.2	7.5	11.5

Outline Dimension Drawing

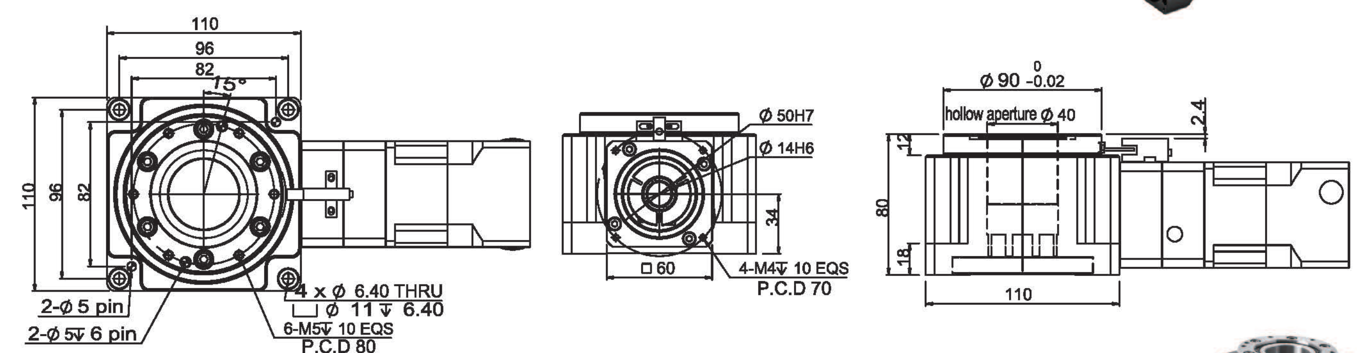


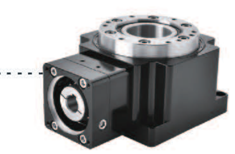
RT110-10-N



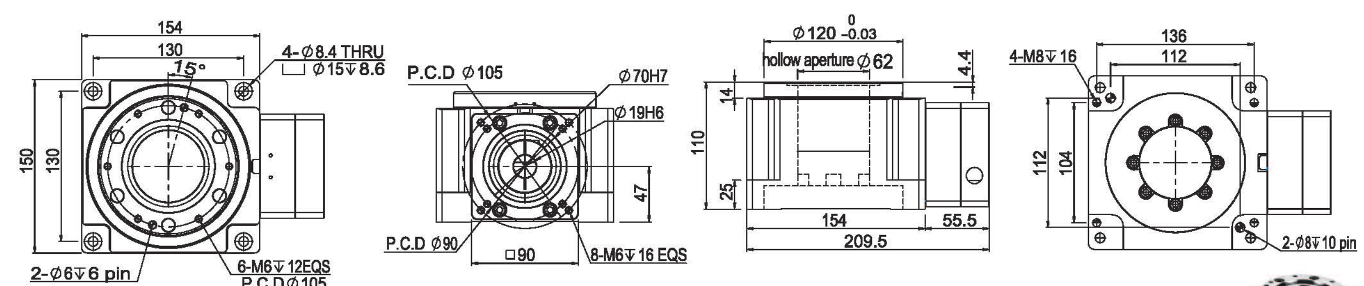


RT110-K-(30/50/70)-N

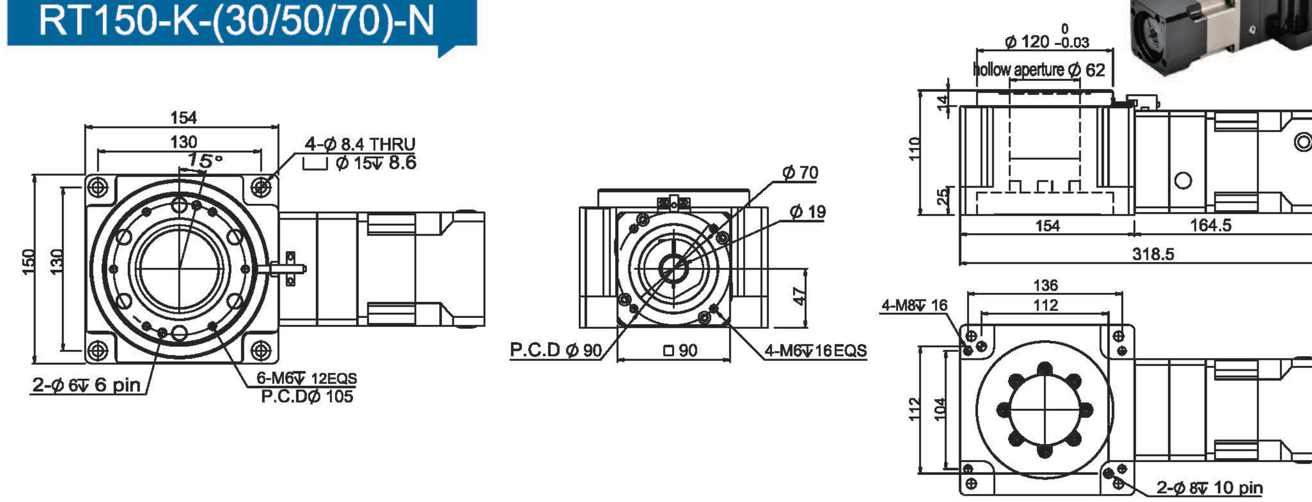




RT150-10-N



RT150-K-(30/50/70)-N



RK Series

Hypotooth Hollow Rotating Platform

Ordering Model Indication

RK - 100 - 30 - N

Code	Model Specification	Ratio	Motor Specification
RK	60 100 150 200	30	N: Φ8 PCD45 M3 / PCD70 M4 PCD90 M6 / PCD145 M8 N1: Φ8 PCD46 M4 / PCD70 M5 / PCD145 M8 N2: PCD70 M4

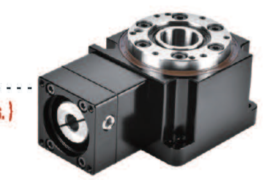
Technical Parameter

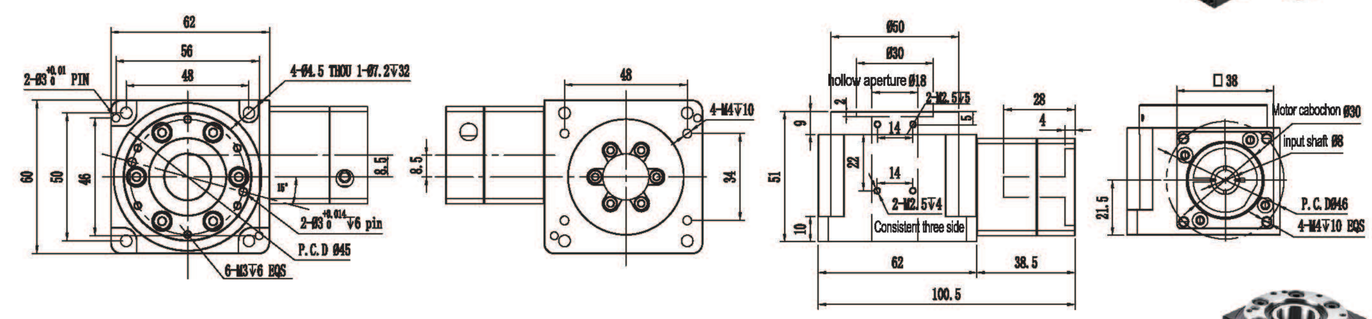
Model	Unit	RK60-30-N	RK100-30-N	RK150-30-N	RK200-30-N
Matching motor specifications	W	100	400	750	1000
Rotating platform bearings		/	/	/	/
Permissible torque	N.M	35	120	220	450
Allowable moment of inertia	N.M	40	140	240	500
Allowable disk speed	rpm	200	100	100	100
Ratio	i	30	30	30	30
Repeat positioning accuracy	arc-sec	±5	±5	±5	±5
Positioning accuracy	arc-min	1	30	30	30
Precision life	h	30000	30000	30000	30000
Allowable axial load	N	800	3000	7000	12000
Rotational plane amplitude	mm	±0.005	±0.005	±0.005	±0.005
Rotational concentricity	mm	±0.005	±0.005	±0.005	±0.005
Protection level	IP	50	50	50	50
Operating temperature	(°)	-20℃-90℃	-20℃-90℃	-20℃-90℃	-20℃-90℃
Weight	kg	0.9	8.5	18	59

Outline Dimension Drawing

RK60-30-N

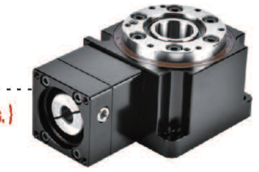
(The speed ratio of the main body is 30. If the speed ratio is not enough, you can add a planetary reduction ratio. Please consult for details.)

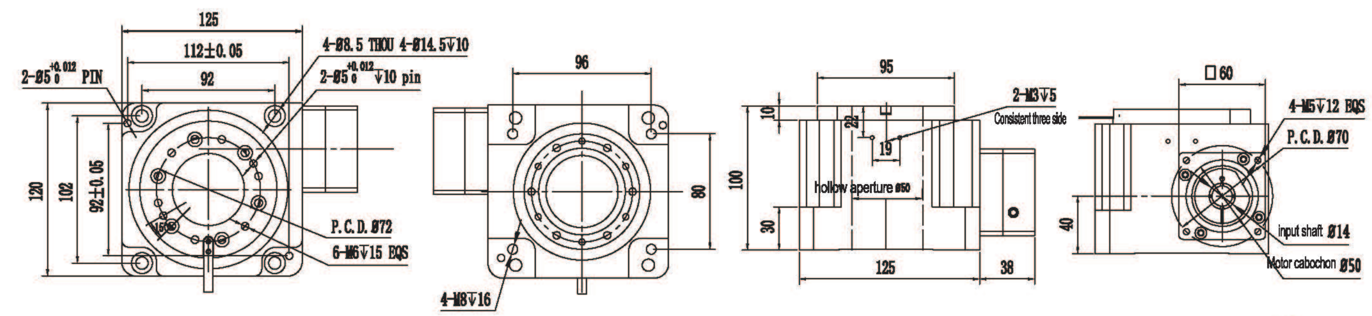




RK100-30-N

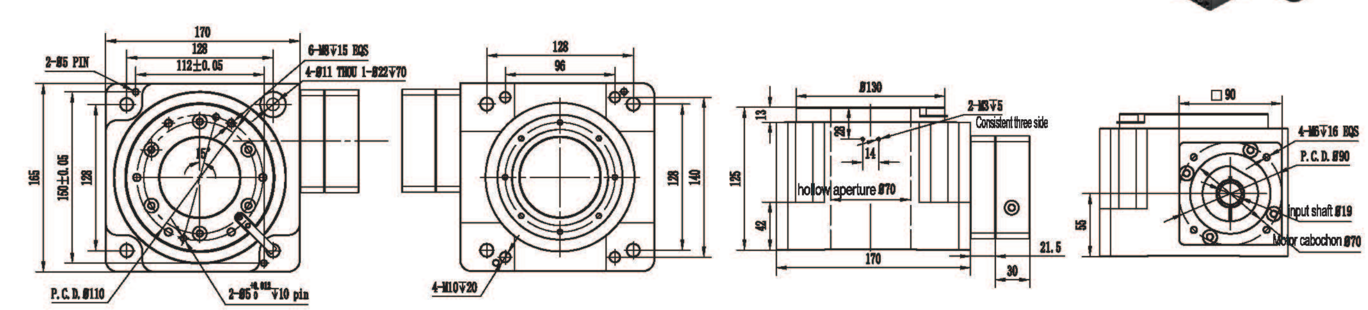
(The speed ratio of the main body is 30. If the speed ratio is not enough, you can add a planetary reduction ratio. Please consult for details.)





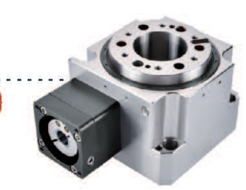
RK150-30-N

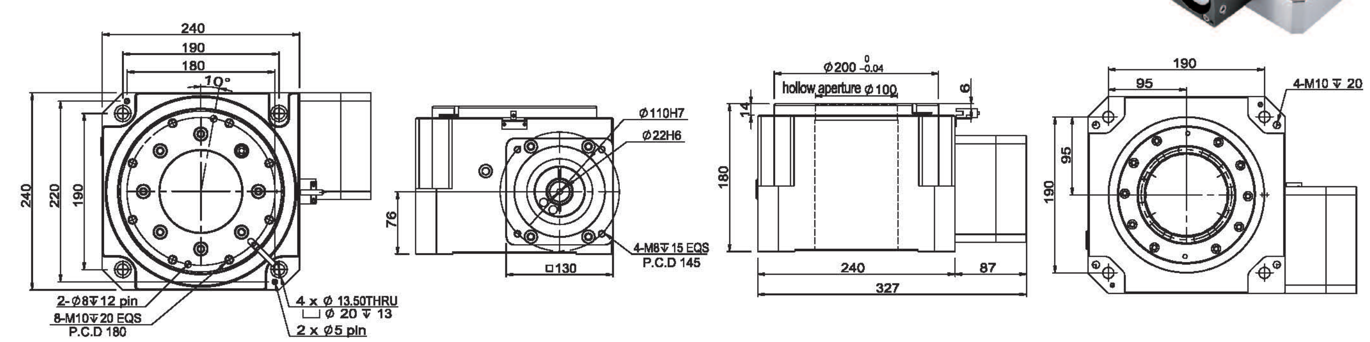
(The speed ratio of the main body is 30. If the speed ratio is not enough, you can add a planetary reduction ratio. Please consult for details.)



RK200-30-N

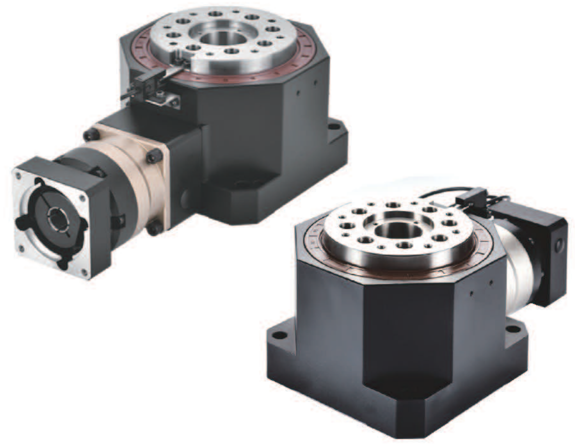
(The speed ratio of the main body is 30. If the speed ratio is not enough, you can add a planetary reduction ratio. Please consult for details.)





RM Series

Right angle hollow rotating platform



Ordering Model Indication

RM - 130 - 30 - 14 - 50 - 70

Code	Model Specification	Ratio	Motor shaft diameter	Motor Positioning Boss	Motor mounting hole distance
RM	130 180 225 260	L1: 15/21/30/50 L2: 60/75/90/120 150/210/300			

Can be equipped with double-stage planetary gears . Please consult sales engineers for specific parameters and dimensions.

Note: (Diagonal hole distance of servo motor mounting surface)
(Single-side hole distance of stepper motor mounting surface)

Technical Parameter

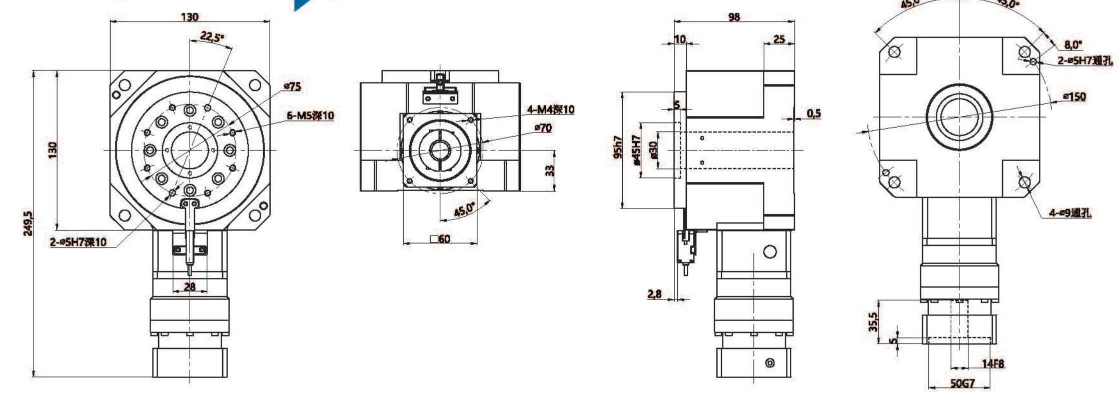
Model	Unit	RM130-L1				RM180-L1				RM225-L1				RM260-L1			
Bearing strudure		Cross roller bearing															
Reduction ratio	i	15	21	30	50	15	21	30	50	15	21	30	50	15	21	30	50
Rated output torque	N.m	150	150	150	110	470	470	470	315	1350	1350	1350	950	2950	2950	2950	1950
Qutput torque	N.m	3 Times rated torque															
Positioning accuracy	arc-min	≤1.5				≤1.5				≤1.5				≤2			
Repeated postioning acouracy	arc-sec	≤30				≤30				≤30				≤30			
Allowable disk speed	rpm	200 Intermittent operation															
Adapt to servo motor	W	200–400				750–1500				1000–3000				2000–5000			
Suitable for stepping motor		57 Stepper				86 Stepper				130/150 Stepper				130/150 Stepper			
Allowable axial load	N	7300				13500				19500				29600			
Allowable radial load	N	7300				13500				19500				29600			
Design load	Kg	70				230				480				1000			
Allowable moment of inertia	N.m	50				110				220				750			
Torsional rigidity	N.m/arcmln	25				45				80				175			
Overturning moment	N.m	520				1420				2530				6300			
Accuracy life	h	20000h Intermittent operation															
Probection level	IP	65															
Lubricabion method		Long–term lubrication															
Installation method		Arbitrary															
Concentbricity of rotating platform	mm	≤0.01															
Parallelsm of rotating platform	mm	≤0.01															
Transmission efficiency	%	95				95				95				95			
Nolse	db	≤57				≤63				≤67				≤67			
Weight	Kg	7				17				36				46			

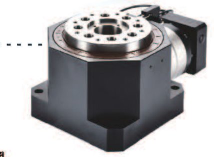
Note: If you have higher requirements for the parallelism of the rotating platform, please contact our sales staff.

Outline Dimension Drawing

RM130-(15/21/30/50)

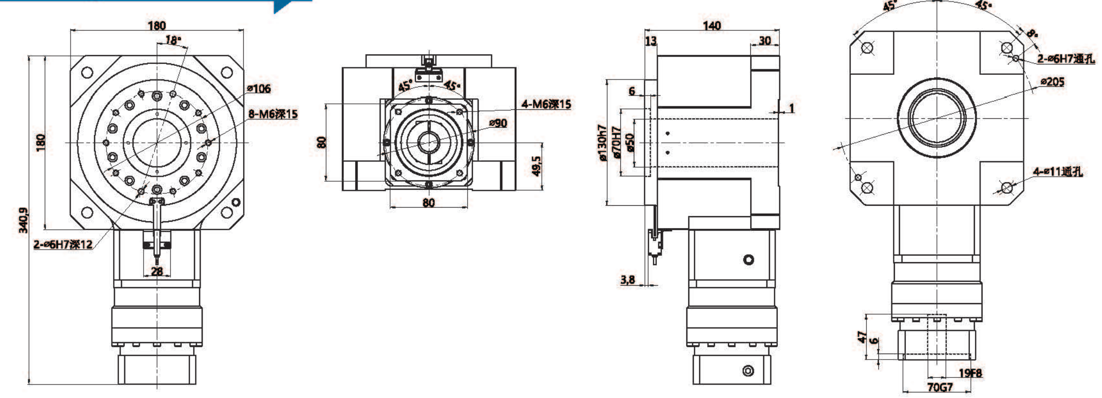
Can be equipped with servo motor 200-400W, 57 stepper

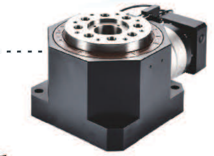




RM180-(15/21/30/50)

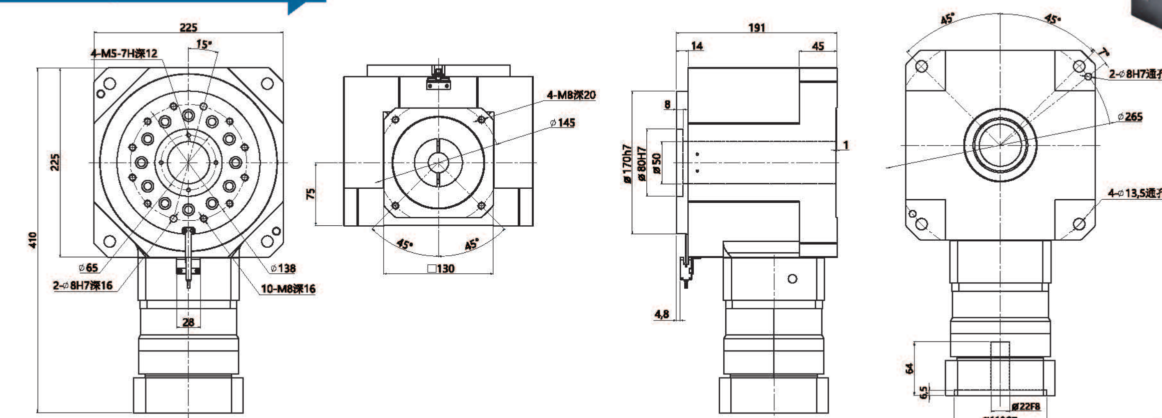
Can be equipped with servo motor 750-1500W, 86/110 stepper





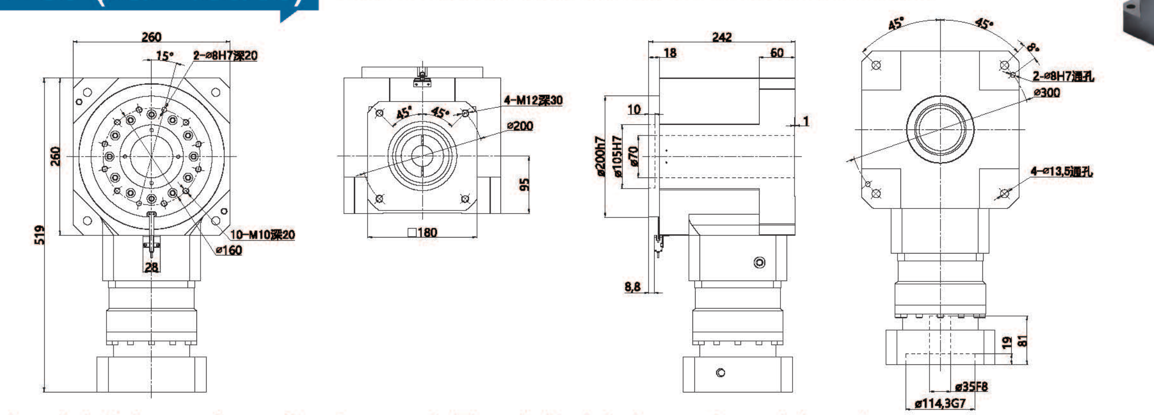
RM225-(15/21/30/50)

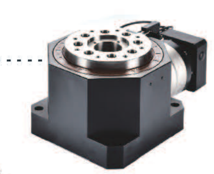
Can be equipped with servo motor 1000-3000W, 130/150 stepper



RM260-(15/21/30/50)

Can be equipped with servo motor 2000-5000W, 130/150 stepper





* The above technical parameters are for reference only. The actual technical parameters and dimensions will be issued based on the data provided by the customer.