

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 & torque
The 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

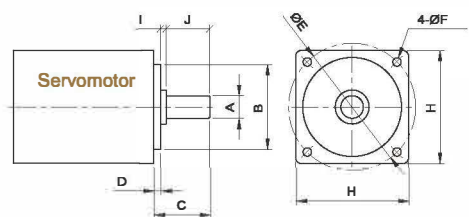
Output Shaft Keyway
S1: Solid Output Shaft No Keyway
S2: Standard (Keyway)
S3: Output for holes

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

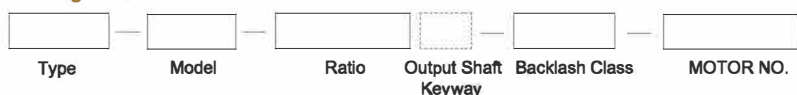
Backlash Grade
P0: High precision backlash
P1: Precision backlash
P2: Standard backlash

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



A	B	C	D	E	F	H	I	J

Naming Scheme:



FB Reducer Specifications

Specs	Unit	Stage	Ratio	FB040	FB060	FB090	FB120	FB160
Rated Output Torque / T2N	Nm	1	3	16	45	125	245	615
			4	17	50	135	298	650
			5	18	55	150	300	688
			7	15	50	145	245	645
			10	13	45	135	205	498
		2	15	16	45	120	198	615
			20	16	50	135	245	650
			25	18	55	150	300	688
			30	14	45	125	245	615
			35	18	55	150	300	688
			40	13	50	135	298	650
			50	17	55	140	265	688
		2	70	14	45	130	256	645
			100	13	40	115	205	498
Max.Output Torque / T _{2NCT} ¹	Nm	1,2	3~100	3Times of Nominal Output Torque				
Rated Input Speed / Π _{1N}	rpm	1,2	3~100	3000	3000	3000	3000	2500
Max.Input Speed / Π _{1s}	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 _{2r} ²	N	1,2	3~100	320	460	1300	3200	6520
Max.Axial Force / F _{2a} 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	°C	1,2	3~100	-25°C~+90°C				
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

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

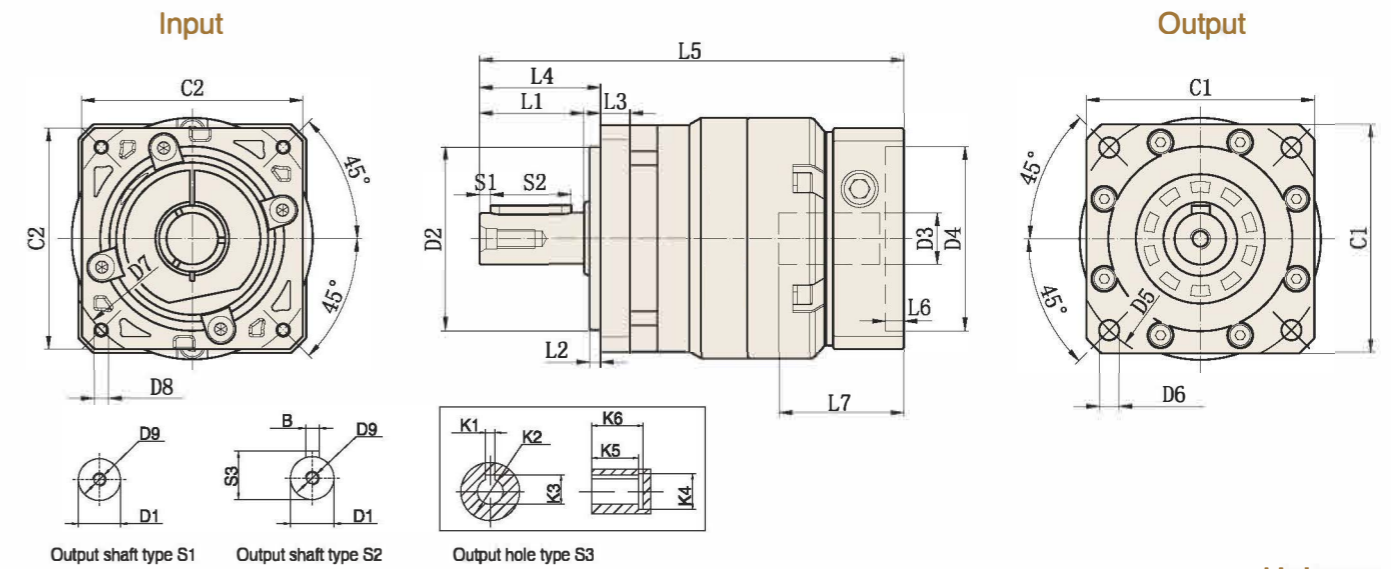
MODEL: FB

1-Stage

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



Dimensions:



Unit:mm

Size	FB040-L1	FB060-L1	FB090-L1	FB120-L1	FB160-L1
D1	φ 12(13)	φ 14(16)	φ 20(22)	φ 25(32)	φ 40
D2	φ 26	φ 50	φ 80	φ 110	φ 130
D3	φ 8(≤11)	φ 14(≤19)	φ 19(≤24)	φ 24(≤32)	φ 35(42)
D4	φ 30(30~50)	φ 50 (50~70)	φ 70 (50~110)	φ 110(70~130)	φ 114.3(110~150)
D5	φ 48	φ 70	φ 100	φ 130	φ 185(165)
D6	4-φ 3.4	4-φ 5.5	4-φ 7	4-φ 9	4-φ 11
D7	φ 46(45~70)	φ 70 (70~130)	φ 90 (70~145)	φ 145(90~165)	φ 200(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	-	φ 8	φ 18	φ 25	φ 35
K3	-	9.2	21	28	38.3
K4	-	φ 11	φ 24	φ 32	φ 42
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.

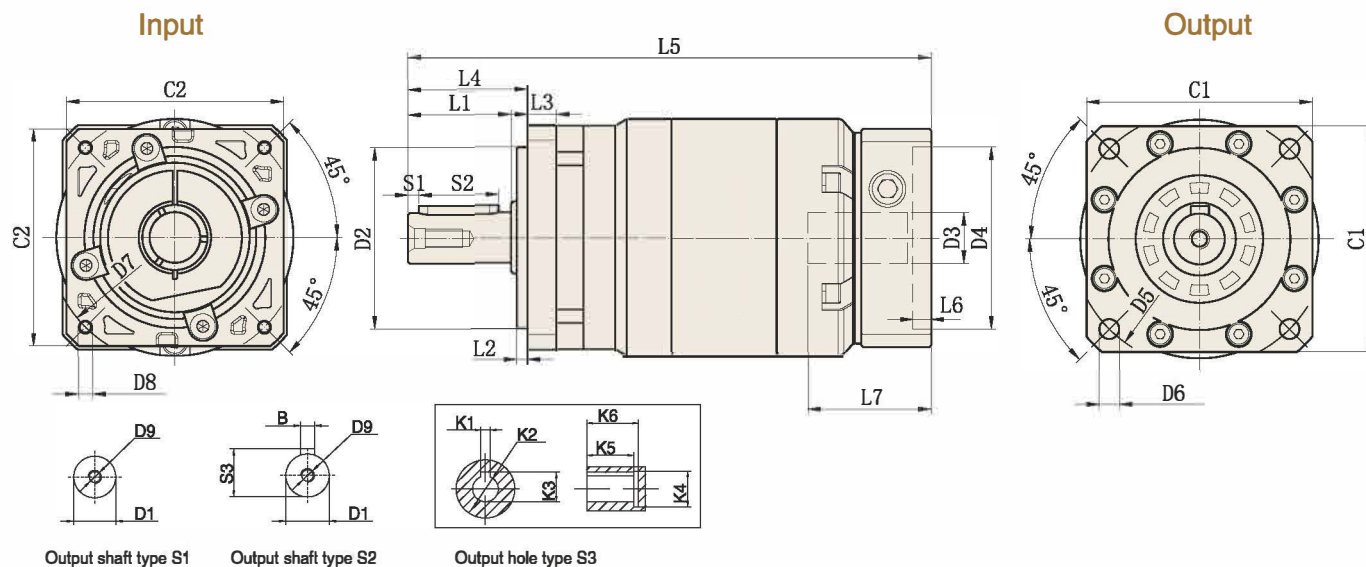
MODEL: FB

2-Stage

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



Dimensions:



Unit:mm

Size	FB040-L2	FB060-L2	FB090-L2	FB120-L2	FB160-L2
D1	φ 12(13)	φ 14(16)	φ 20(22)	φ 25(32)	φ 40
D2	φ 26	φ 50	φ 80	φ 110	φ 130
D3	φ 8(≤11)	φ 14(≤19)	φ 19(≤24)	φ 24(≤32)	φ 35(42)
D4	φ 30(30-50)	φ 50 (50-70)	φ 70 (50-110)	φ 110 (70-130)	φ 114.3(110-150)
D5	φ 48	φ 70	φ 100	φ 130	φ 185(165)
D6	4-φ 3.4	4-φ 5.5	4-φ 7	4-φ 9	4-φ 11
D7	φ 46(45-70)	φ 70 (70-130)	φ 90 (70-145)	φ 145 (90-165)	φ 200(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	-	φ 8	φ 18	φ 25	φ 35
K3	-	9.2	21	28	38.3
K4	-	φ 11	φ 24	φ 32	φ 42
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.