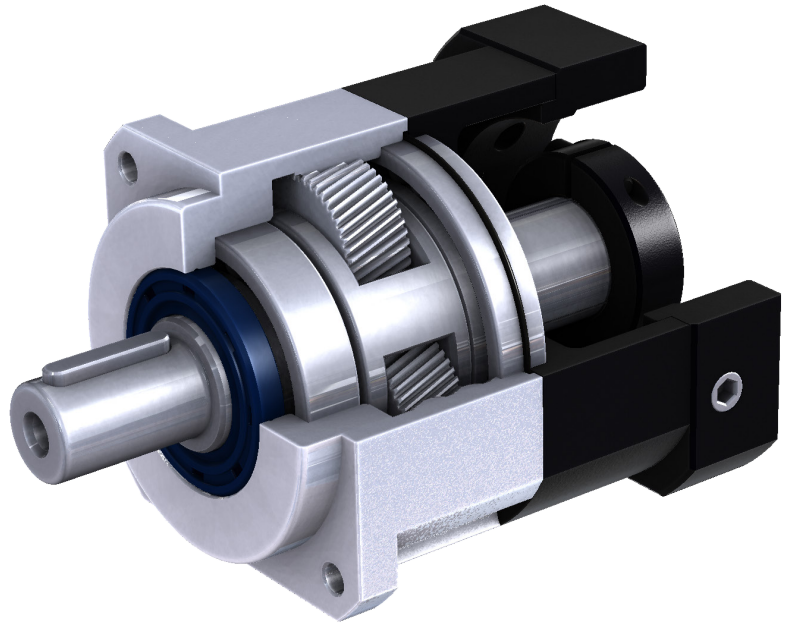


PB series

- 1-Stage Backlash ≤ 8 arcmin
- 2-Stage Backlash ≤ 10 arcmin



Indication of Model Numbers

PB	90	10		MOTOR
Type	Model	Ratio	Shaft Keyway	Output Motor Type
PB PB-A	44 62 90 120 142 180 220	1-Stage 3, 4, 5, 6, 7, 8, 9, 10 2-Stage 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100	<input type="checkbox"/> Standard (Keyway) N: Solid Output Shaft (No Keyway)	

Quiet operation

Helical gears contribute to reduce vibration and noise.

High Torque

High output torque is in comparison with spur gear planetary gear reducers.

High Efficiency

Efficiency for 1-stage model exceeds 97%; 2-stage model exceeds 94%.

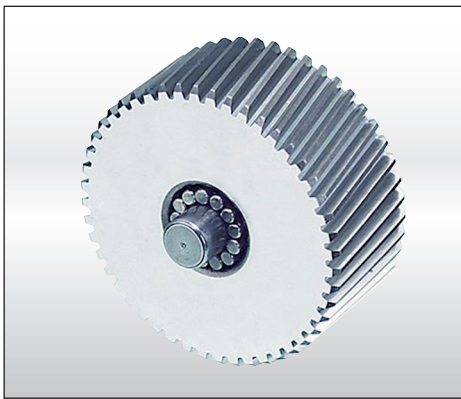
Features of PB Series

PB



Integrated Planetary Arm Bracket

The planetary arm bracket and the output shaft are one-piece constructed to increase torsional rigidity and accuracy.



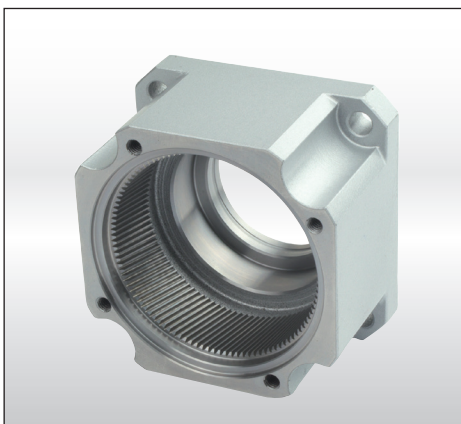
Full Needle Roller Bearings Design

The planetary gear transmission employs full needle roller bearings without retainer to increase the contact surface, which greatly upgrades structural rigidity and service life.



Collet Locking Mechanism

The input-end and the motor are coupled through a collet locking mechanism. It has passed dynamical balance analysis to assure concentricity and balance on the connection and no backlash for power transmission while running at high speed.



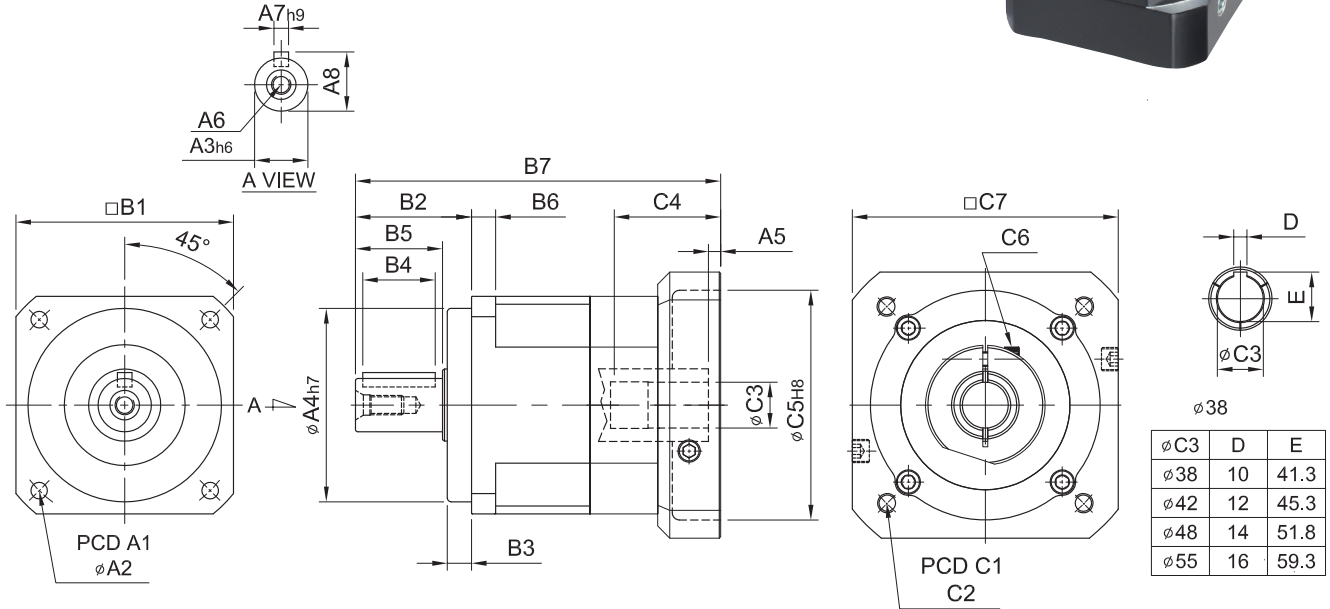
One-piece Helical Gear Box

The gear box and internal ring gear are one-piece constructed. The speed reduction mechanism employs helical gears, which provides two times meshing rate of teeth when comparing with regular spur gears. In addition, it also has features of extremely smooth running, low noise, high output torque and low backlash.

MODEL : PB

1-Stage

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



		unit : mm						
Code	Model	44	62	90	120	142	180	220
A	A1	50	70	100	130	165	215	250
	A2	4.5	5.5	6.8	9	11	13	17
	A3	13	16	22	32	40	55	75
	A4	35	50	80	110	130	160	180
	A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5	12.5 · 14.5
	A6	M4 × P0.7	M5 × P0.8	M8 × P1.25	M10 × P1.5	M12 × P1.75	M14 × P2.0	M16 × P2.0
	A7	5	5	6	10	12	16	20
	A8	15	18	24.5	35	43	59	79.5
B	B1	44	62	90	120	142	180	220
	B2	26	36	48	65	92	106	139
	B3	5	7	10	12	15	20	30
	B4	15	20	30	40	65	70	90
	B5	20	28	36	50	74	82	104
	B6	5	8	10	12	15	16	20
	B7	95	115 · 123	164.5 · 179	205 · 215	260.5	323.5 · 325.5	367.5 · 369.5
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265	200 · 265 · 300
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12 · M16	M12 · M16
	C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	32 · 35 · 38	38 · 42 · 48 · 55	42 · 48 · 55
	C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	116.5 · 118.5	117.5 · 119.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230	114.3 · 230 · 250
	C6	M4 × P0.7	M5 × P0.8	M6 × P1.0	M8 × P1.25	M10 × P1.5	M10 × P1.5	M10 × P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 150 · 190	182 · 200 · 250	222 · 250 · 265

Characteristic of PB 1-Stage PB

Model No.		Unit	Ratio	44	62	90	120	142	180	220
/ Rated Output Torque (Nominal output torque)	T_{2N}	Nm	3	17	54	145	301	553	1,067	1,786
			4	15	48	128	269	491	940	1,587
			5	14	45	132	278	510	1,050	1,770
			6	13	41	125	252	466	985	1,680
			7	13	41	123	258	473	975	1,645
			8	12	39	115	241	442	942	1,605
			9	11	40	120	227	412	875	1,490
			10	12	40	116	246	452	930	1,565
/ Max. Acceleration Torque	T_{2B}	Nm	3~10	1.8 Times of Rated Output Torque						
/ Max. Output Torque / Emergency Stop Torque	T_{2NOT}	Nm	3~10	3 Times of Rated Output Torque						
/ Rated Input Speed	n_{1N}	rpm	3~10	3,000	3,000	3,000	3,000	3,000	3,000	2,000
/ Max. Input Speed	n_{1B}	rpm	3~10	6,000	6,000	6,000	5,000	5,000	4,000	3,000
/ Torsional Rigidity		Nm/arcmin	3~10	3	6	14	27	60	140	240
/ Max. Radial Force	F_{2rB}	N	3~10	360	1,120	3,040	6,460	8,830	14,820	48,450
/ Max. Axial Force	F_{2aB}	N	3~10	180	560	1,520	3,230	4,410	7,410	24,225
/ Service Life	L_H	hr	3~10	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)						
/ Efficiency	η	%	3~10	$\geq 97\%$						
/ Operating Temperature		°C	3~10	-25° C ~ +90° C						
/ Lubrication			3~10	Synthetic Grease						
/ Protection Class			3~10	IP65						
/ Mounting Position			3~10	Any						
/ Noise Level		dB	3~10	≤ 56	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
/ Weight $\pm 3\%$		Kg	3~10	0.58	1.35	3.69	8.63	14.55	28.3	42.5

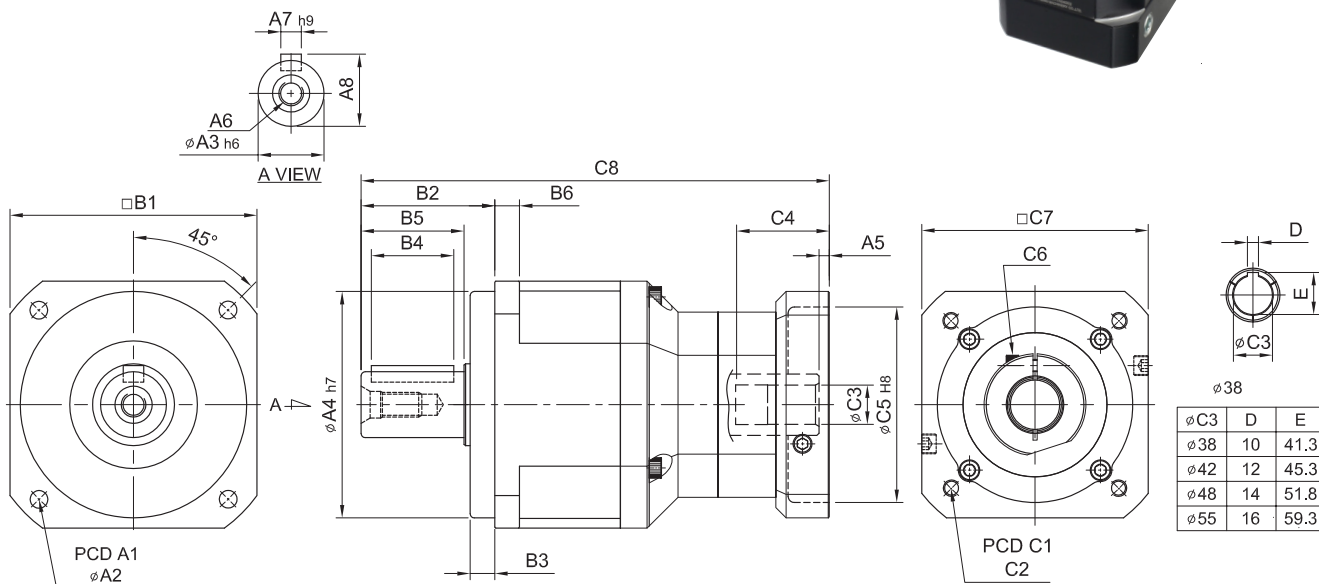
Mass Moments of Inertia (kg.cm²)

Ratio	44	62	90	120	142	180	220
3	0.03	0.16	0.61	3.25	9.21	28.98	59.61
4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
5	0.03	0.13	0.47	2.74	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

MODEL : PB

2-Stage

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



unit : mm

Code	Model	62	90	120	142	180	220
A	A1	70	100	130	165	215	250
	A2	5.5	6.8	9	11	13	17
	A3	16	22	32	40	55	75
	A4	50	80	110	130	160	180
	A5	5	6	9 · 23.5	10 · 20	10	11.5 · 13.5
	A6	M5 × P0.8	M8 × P1.25	M10 × P1.5	M12 × P1.75	M14 × P2.0	M16 × P2.0
	A7	5	6	10	12	16	20
	A8	18	24.5	35	43	59	79.5
B	B1	62	90	120	142	180	220
	B2	36	48	65	92	106	139
	B3	7	10	12	15	20	30
	B4	20	30	40	65	70	90
	B5	28	36	50	74	82	104
	B6	8	10	12	15	16	20
C	C1	46 · 60 · 63	70 · 75 · 90	90 · 100 · 115 · 145	115 · 145 · 165	145 · 165 · 200	200 · 215 · 265
	C2	M3 · M4 · M5	M4 · M5 · M6	M5 · M6 · M8	M6 · M8 · M10	M8 · M10 · M12	M10 · M12
	C3	8 · 9 · 11	14 · 19	19 · 22 · 24	24 · 28 · 32	32 · 35 · 38	38 · 42 · 48 · 55
	C4	26	33.5 · 41.5	59 · 73.5	67 · 77	84.5	116.5 · 118.5
	C5	30 · 40 · 50	50 · 60 · 70	70 · 80 · 95 · 110	70 · 95 · 110 · 130	110 · 130 · 180	114.3 · 180 · 230
	C6	M4 × P0.7	M5 × P0.8	M6 × P1.0	M8 × P1.25	M10 × P1.5	M10 × P1.5
	C7	46 · 55	64 · 70 · 80	92 · 110 · 130	122 · 130 · 150	146 · 180 · 190	182 · 200 · 250
	C8	139.5	172.5 · 180.5	241 · 255.5	298.5 · 308.5	358.5	446.5 · 448.5

Characteristic of PB 2-Stage PB

Model No.		Unit	Ratio	62	90	120	142	180	220
/ Rated Output Torque (Nominal output torque)	T_{2N}	Nm	15	54	145	301	553	1,067	1,786
			20	48	128	269	491	940	1,587
			25	45	132	278	510	1,050	1,770
			30	41	125	252	466	985	1,680
			35	41	123	258	473	975	1,645
			40	39	115	241	442	942	1,605
			50	45	132	278	510	1,050	1,770
			60	41	125	252	466	985	1,680
			70	41	123	258	473	975	1,645
			80	40	115	241	442	942	1,605
			90	40	120	227	412	875	1,490
			100	40	116	246	452	930	1,565
/ Max. Acceleration Torque	T_{2B}	Nm	15~100	1.8 Times of Rated Output Torque					
/ Max. Output Torque / Emergency Stop Torque	T_{2NOT}	Nm	15~100	3 Times of Rated Output Torque					
/ Rated Input Speed	n_{IN}	rpm	15~100	3,000	3,000	3,000	3,000	3,000	3,000
/ Max. Input Speed	n_{IB}	rpm	15~100	6,000	6,000	5,000	5,000	4,000	4,000
/ Torsional Rigidity		Nm/arcmin	15~100	6	14	27	60	140	240
/ Max. Radial Force	F_{2rB}	N	15~100	1,120	3,040	6,460	8,830	14,820	48,450
/ Max. Axial Force	F_{2aB}	N	15~100	560	1,520	3,230	4,410	7,410	24,225
/ Service Life	L_H	hr	15~100	S5 Cycle Operation: >30,000 (S1 Continuous Operation: >15,000 hrs)					
/ Efficiency	η	%	15~100	$\geq 94\%$					
/ Operating Temperature		°C	15~100	-25° C ~ +90° C					
/ Lubrication			15~100	Synthetic Grease /					
Protection Class			15~100	IP65					
/ Mounting Position			15~100	Any					
/ Noise Level		dB	15~100	≤ 58	≤ 60	≤ 63	≤ 65	≤ 67	≤ 70
/ Weight $\pm 3\%$		Kg	15~100	1.6	4.04	9.49	17	34.1	57.3

Mass Moments of Inertia (kg.cm²)

Ratio	62	90	120	142	180	220
15	0.03	0.14	0.46	2.63	7.3	22.79
20	0.03	0.14	0.46	2.63	7.3	22.79
25	0.03	0.14	0.46	2.63	7.1	22.79
30	0.03	0.14	0.46	2.43	7.1	22.59
35	0.03	0.14	0.44	2.43	7.1	22.59
40	0.03	0.14	0.44	2.43	6.92	22.59
50	0.03	0.14	0.44	2.43	6.92	22.59
60	0.03	0.14	0.43	2.39	6.72	21.83
70	0.03	0.14	0.43	2.39	6.72	21.83
80	0.03	0.14	0.43	2.39	6.72	21.83
90	0.03	0.14	0.40	2.39	6.72	21.60
100	0.03	0.14	0.40	2.39	6.72	21.60